

SUPERO[®]

SUPERSERVER 1027R-WRF



USER'S MANUAL

Revision 1.0

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Manual Revision 1.0

Release Date: August 31, 2012

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Preface

About This Manual

This manual is written for professional system integrators and PC technicians. It provides information for the installation and use of the SuperServer 1027R-WRF. Installation and maintenance should be performed by experienced technicians only.

The SuperServer 1027R-WRF is a high-end server based on the SC113TQ-R700WB 1U rackmount chassis and the X9DRW-iF dual processor serverboard.

Manual Organization

Chapter 1: Introduction

The first chapter provides a checklist of the main components included with the server system and describes the main features of the X9DRW-iF serverboard and the SC113TQ-R700WB chassis.

Chapter 2: Server Installation

This chapter describes the steps necessary to install the SuperServer 1027R-WRF into a rack and check out the server configuration prior to powering up the system. If your server was ordered without processor and memory components, this chapter will refer you to the appropriate sections of the manual for their installation.

Chapter 3: System Interface

Refer here for details on the system interface, which includes the functions and information provided by the control panel on the chassis as well as other LEDs located throughout the system.

Chapter 4: System Safety

You should thoroughly familiarize yourself with this chapter for a general overview of safety precautions that should be followed when installing and servicing the SuperServer 1027R-WRF.

Chapter 5: Advanced Serverboard Setup

Chapter 5 provides detailed information on the X9DRW-iF serverboard, including the locations and functions of connections, headers and jumpers. Refer to this chapter when adding or removing processors or main memory and when reconfiguring the serverboard.

Chapter 6: Advanced Chassis Setup

Refer to Chapter 6 for detailed information on the SC113TQ-R700WB server chassis. You should follow the procedures given in this chapter when installing, removing or reconfiguring SAS/SATA or peripheral drives and when replacing system power supply units and cooling fans.

Chapter 7: BIOS

The BIOS chapter includes an introduction to BIOS and provides detailed information on running the CMOS Setup Utility for the X9DRW-iF serverboard.

Appendix A: BIOS Error Beep Codes

Appendix B: Installing Windows

Appendix C: System Specifications

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Appendix A BIOS Error Beep Codes

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Chapter 1

Introduction

1-1 Overview

Supermicro's SUPERSERVER 1027R-WRF is a dual processor, 1U rackmount server. The 1027R-WRF is a high-end server comprised of two main subsystems: the SC113TQ-R700WB 1U server chassis and the X9DRW-iF dual processor serverboard. Please refer to our web site for information on operating systems that have been certified for use with the system (www.supermicro.com).

In addition to the serverboard and chassis, various hardware components have been included with the 1027R-WRF, as listed below:

- Two (2) 1U passive CPU heat sink (SNK-P0047PS)
- One (1) SC815/113/116 Intel DP X9, X8 PC air shroud (MCP-310-19002-0N)
- Five (5) 40x56mm 4-pin PWM fans (FAN-0086L4)
- One (1) 70-cm front control cable 20-pin-to-20-pin w/tube (CBL-0335L)
- SAS/SATA Accessories
 - One (1) HD Backplane (BPN-SAS-113TQ-O-P)
 - One (1) 30 AWG 70/60/50/50-cm, W/70-cm SB AOC connection cable (CBL-0288L-01)
 - One (1) 30 AWG lpass to 4SATA 90/90/70/70-cm W/70-cm SB AOC connection cable (CBL-0388L-01)
 - Eight (8) 2.5" hot-swap hard disk drive trays (MCP-220-00047-0B)
- One (1) set outer rail for 1U chassis (MCP-290-00101-0N)
- One (1) set inner rail, front for 1U chassis (MCP-290-00107-0N)
- One (1) set inner rail, extension for 1U chassis (MCP-290-00111-0N)
- One (1) riser card (RSC-R1UW-2E16-O-P)
- One CD containing drivers and utilities

1-2 Serverboard Features

At the heart of the SUPERSERVER 1027R-WRF lies the X9DRW-iF, a dual processor serverboard based on the C602 chipset. Below are the main features of the X9DRW-iF. (See Figure 1-1 for a block diagram of the chipset).

Processors

The X9DRW-iF supports single or dual E5-2600 series processors in Socket R LGA 2011 type sockets. Please refer to our web site for a complete listing of supported processors (www.supermicro.com).

Memory

The X9DRW-iF has sixteen (16) single/dual/tri/quad channel 240-pin DIMM sockets that can support up to 512 GB of DDR3 1600/1333/1066/800 MHz speed registered ECC RDIMM/LRDIMM SDRAM in two-channel memory bus. Memory sizes of 512 MB, 1 GB, 2 GB, 4 GB, 8 GB, 16 GB or 32 GB size @ 1.35V/1.5V voltages are supported. Please refer to Chapter 5 for installing memory.

Note: LRDIMM (Reduced Load) memory supports only 1333/1066/800 MHz speed memory.

Serial ATA

An on-chip (Intel PCH C602) SATA controller is integrated into the X9DRW-iF to provide a six-port SATA subsystem (two SATA 3.0 and four SATA 2.0 ports), which is RAID 0, 1, 5 and 10 (Windows SATA) or RAID 0, 1 and 10 (LINUX) supported. By default these SATA ports are not used in this server, but you can add optional cables to connect to these ports. The SATA drives are hot-swappable units.

Note: You must have RAID set up to enable the hot-swap capability of the SATA drives. Documentation on RAID setup guidelines can be found on our web site.

Onboard Controllers/Ports

The color-coded I/O ports on the X9DRW-iF include two COM ports (one header and one port), a VGA (monitor) port, six USB 2.0 ports (4x rear, 1x header for two front panel), two gigabit Ethernet ports and one dedicated IPMI LAN port.

Note: For more information on IPMI configuration, please refer to the IPMI User's Guide posted on our website at <http://www.supermicro.com/support/manuals/>

Graphics Controller

The X9DRW-iF features an integrated Renesas Base-board Controller (BMC) chip, which also acts as a video controller.

Other Features

Other onboard features that promote system health include onboard voltage monitors, auto-switching voltage regulators, chassis and CPU overheat sensors, power management, AC power loss recovery, virus protection and BIOS rescue.

1-3 Server Chassis Features

The SC113TQ-R700WB is Supermicro's third-generation 1U chassis and features eight 2.5" hard drive bays and two high-efficiency power supplies. The following is a general outline of the main features of the SC113TQ-R700WB chassis.

System Power

When configured as a SuperServer 1027R-WRF, the SC113TQ-R700WB chassis includes two redundant 700 Watt power supplies.

Hard Drive Subsystem

The SC113TQ-R700WB chassis was designed to support eight hot-swap SATA hard drives.

PCI Expansion Slots

A riser card (RSC-R1UW-2E16-O-P) on the left side of the chassis can support two PCI-E x16 cards. See section 5-6 for further details.)

Front Control Panel

The SC113TQ-R700WB control panel provides important system monitoring and control information. LEDs indicate power on, network activity, hard disk drive activity and a UID (Universal Information) LED. Also present are a main power button, a system reset button and a UID button.

I/O Backplane

The SC113TQ-R700WB is an extended ATX form factor chassis that is designed to be used in a 1U rackmount configuration. Ports on the I/O backplane include one COM port, a VGA port, four USB 2.0 ports, two one-gigabit Ethernet ports and a dedicated IPMI LAN port. A UID (Unit Identifier) button and LED are also located beside the VGA port.

Cooling System

The SuperServer 1027R-WRF has an innovative cooling design that features five sets of 4-cm counter-rotating fans located in the middle section of the chassis. There is a "Fan Speed Control Mode" setting in IPMI that allows chassis fan speed to be determined by system temperature. The power supply module also includes a cooling fan.

1-4 Advanced Power Management

Intel® Intelligent Power Node Manager (NM)

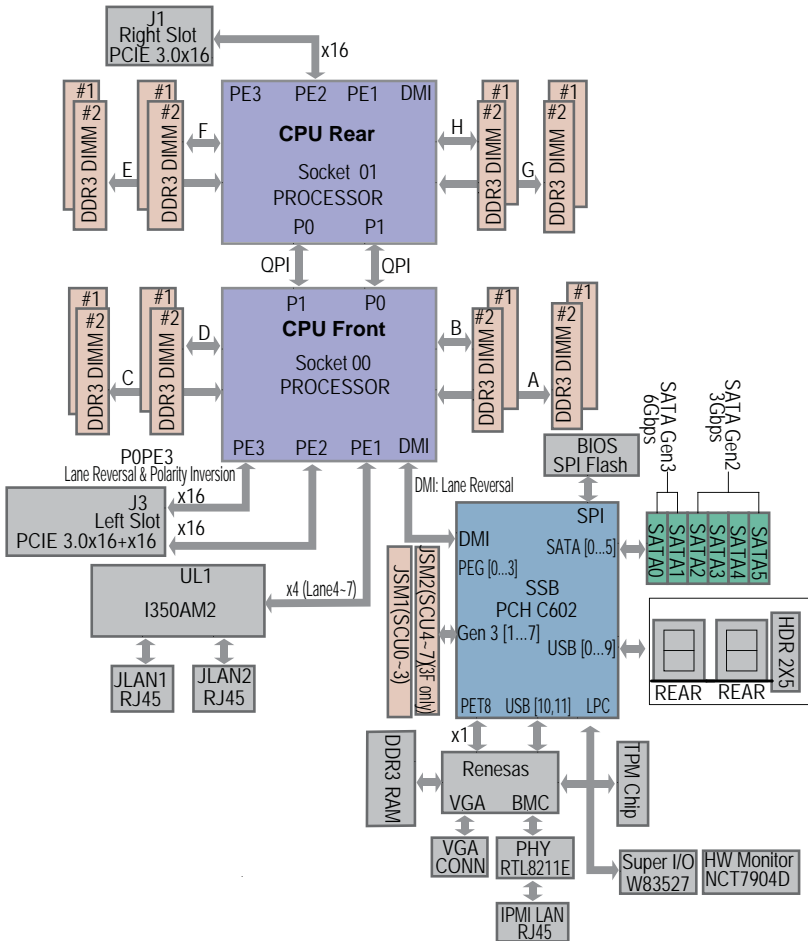
The Intel® Intelligent Power Node Manager (IPNM) provides your system with real-time thermal control and power management for maximum energy efficiency. Although IPNM Specification Version 1.5 is supported by the BMC (Baseboard Management Controller), your system must also have IPNM-compatible Manageability Engine (ME) firmware installed to use this feature.

Manageability Engine (ME)

The Manageability Engine, which is an ARC controller embedded in the IOH (I/O Hub), provides Server Platform Services (SPS) to your system. The services provided by SPS are different from those provided by the ME on client platforms.

**Figure 1-1. C602 Chipset:
System Block Diagram**

Note: This is a general block diagram. Please see Chapter 5 for details.



1-5 Contacting Supermicro

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Chapter 2

Server Installation

2-1 Overview

This chapter provides a quick setup checklist to get your SuperServer 1027R-WRF up and running. Following these steps in the order given should enable you to have the system operational within a minimum amount of time. This quick setup assumes that your system has come to you with the processors and memory preinstalled. If your system is not already fully integrated with a serverboard, processors, system memory etc., please turn to the chapter or section noted in each step for details on installing specific components.

2-2 Unpacking the System

You should inspect the box the SuperServer 1027R-WRF was shipped in and note if it was damaged in any way. If the server itself shows damage you should file a damage claim with the carrier who delivered it.

Decide on a suitable location for the rack unit that will hold the SuperServer 1027R-WRF. It should be situated in a clean, dust-free area that is well ventilated. Avoid areas where heat, electrical noise and electromagnetic fields are generated. You will also need it placed near a grounded power outlet. Be sure to read the Rack and Server Precautions in the next section.

2-3 Preparing for Setup

The box the SuperServer 1027R-WRF was shipped in should include two sets of rail assemblies, two rail mounting brackets and the mounting screws you will need to install the system into the rack. Follow the steps in the order given to complete the installation process in a minimum amount of time. Please read this section in its entirety before you begin the installation procedure outlined in the sections that follow.

Choosing a Setup Location

- Leave enough clearance in front of the rack to enable you to open the front door completely (~25 inches) and approximately 30 inches of clearance in the back of the rack to allow for sufficient airflow and ease in servicing. This product is for installation only in a Restricted Access Location (dedicated equipment rooms, service closets and the like).
- This product is not suitable for use with visual display work place devices according to §2 of the the German Ordinance for Work with Visual Display Units.

2-4 Precautions!

Rack Precautions

- Ensure that the leveling jacks on the bottom of the rack are fully extended to the floor with the full weight of the rack resting on them.
- In single rack installation, stabilizers should be attached to the rack. In multiple rack installations, the racks should be coupled together.
- Always make sure the rack is stable before extending a component from the rack.
- You should extend only one component at a time - extending two or more simultaneously may cause the rack to become unstable.

Server Precautions

- Review the electrical and general safety precautions in Chapter 4.
- Determine the placement of each component in the rack *before* you install the rails.
- Install the heaviest server components on the bottom of the rack first, and then work up.
- Use a regulating uninterruptible power supply (UPS) to protect the server from power surges, voltage spikes and to keep your system operating in case of a power failure.
- Allow the hot plug SATA drives and power supply modules to cool before touching them.
- Always keep the rack's front door and all panels and components on the servers closed when not servicing to maintain proper cooling.

Rack Mounting Considerations

Ambient Operating Temperature

If installed in a closed or multi-unit rack assembly, the ambient operating temperature of the rack environment may be greater than the ambient temperature of the room. Therefore, consideration should be given to installing the equipment in an environment compatible with the manufacturer's maximum rated ambient temperature (Tmra).

Reduced Airflow

Equipment should be mounted into a rack so that the amount of airflow required for safe operation is not compromised.

Mechanical Loading

Equipment should be mounted into a rack so that a hazardous condition does not arise due to uneven mechanical loading.

Circuit Overloading

Consideration should be given to the connection of the equipment to the power supply circuitry and the effect that any possible overloading of circuits might have on overcurrent protection and power supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.

Reliable Ground

A reliable ground must be maintained at all times. To ensure this, the rack itself should be grounded. Particular attention should be given to power supply connections other than the direct connections to the branch circuit (i.e. the use of power strips, etc.).

2-5 Installing the System into a Rack

This section provides information on installing the SuperServer 1027R-WRF into a rack. If the SuperServer 1027R-WRF has already been mounted into a rack, you can skip ahead to Sections 2-5 and 2-6.

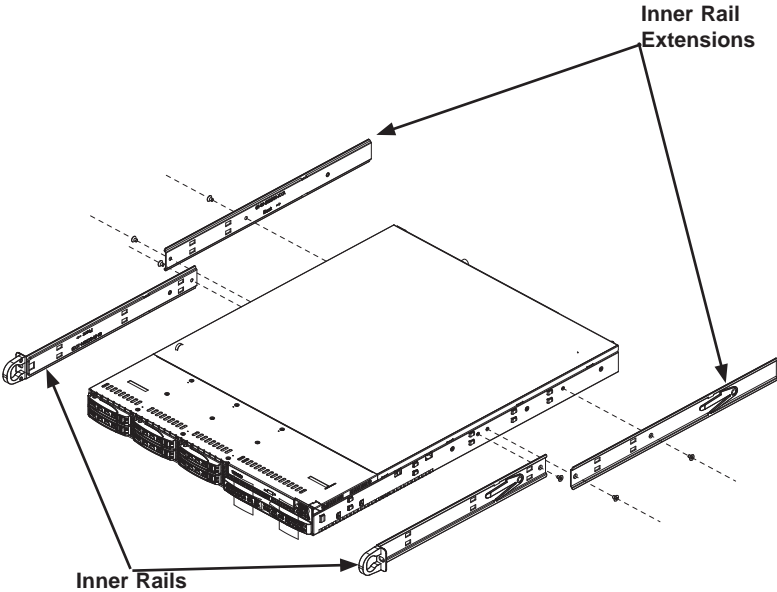
Note: This rail will fit a rack between 26" and 33.5" deep.

There are a variety of rack units on the market, which may mean the assembly procedure will differ slightly. The following is a guideline for installing the SuperServer 1027R-WRF into a rack with the rack rails provided. You should also refer to the installation instructions that came with the rack unit you are using.

Identifying the Sections of the Rack Rails

Each assembly consists of two sections: an inner fixed chassis rail that secures directly to the server chassis and an outer fixed rack rail that secures directly to the rack itself.

Figure 2-1. Identifying the Sections of the Rack Rails



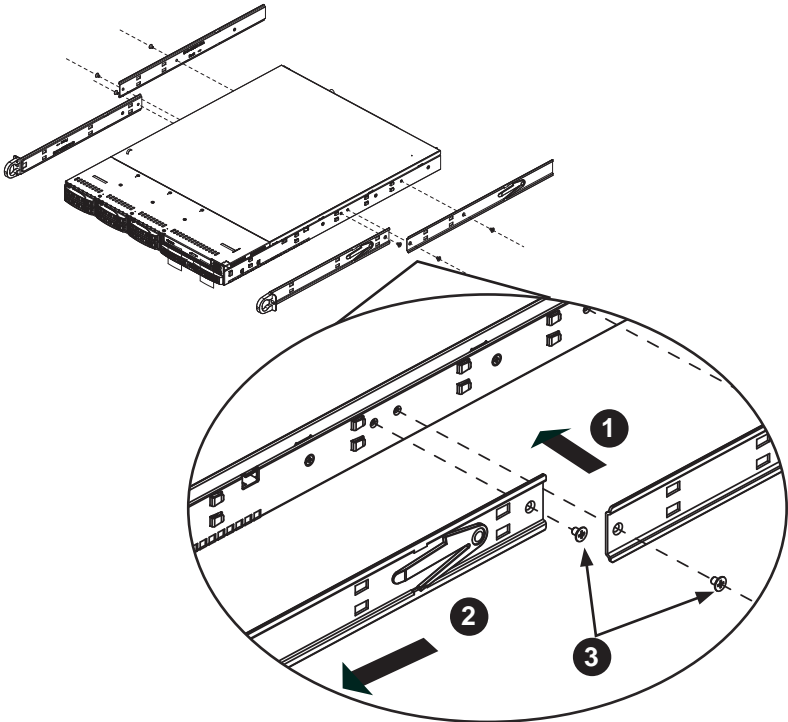
Inner Rails

The SC113 chassis includes a set of inner rails in two sections: inner rails and inner rail extensions. The inner rails are pre-attached and do not interfere with normal use of the chassis if you decide not to use a server rack. Attach the inner rail extension to stabilize the chassis within the rack.

Installing the Inner Rails (Figure 2-2)

1. Place the inner rack extensions on the side of the chassis aligning the hooks of the chassis with the rail extension holes. Make sure the extension faces "outward" just like the pre-attached inner rail.
2. Slide the extension toward the front of the chassis.
3. Secure the chassis with two screws as illustrated.
4. Repeat steps 1-3 for the other inner rail extension.

Figure 2-2. Installing Chassis Rails



Outer Rails

Installing the Outer Rails to the Rack (Figures 2-3 and 2-4)

1. Attach the short bracket to the outside of the long bracket. You must align the pins with the slides. Also, both bracket ends must face the same direction.
2. Adjust both the short and long brackets to the proper distance so that the rail fits snugly into the rack.
3. Secure the long bracket to the front side of the outer rail with two M5 screws and the short bracket to the rear side of the outer rail with three M5 screws.
4. Repeat steps 1-4 for the left outer rail.

Figure 2-3. Assembling the Outer Rails

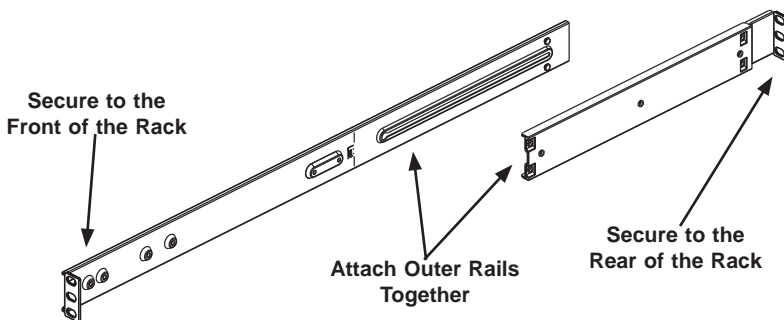
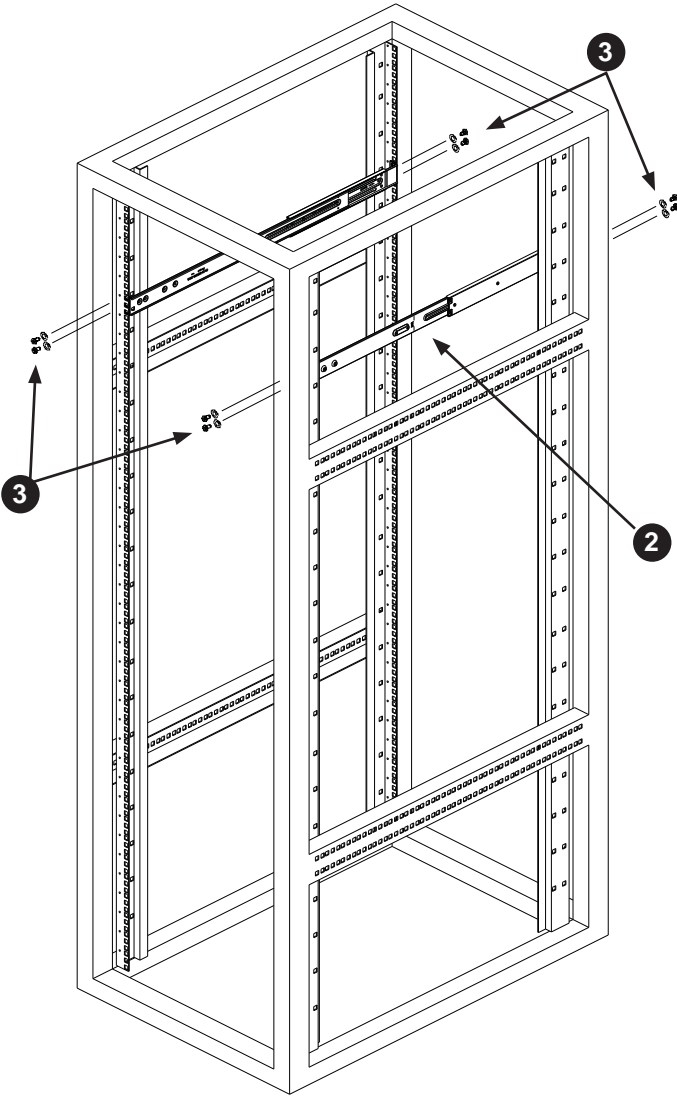
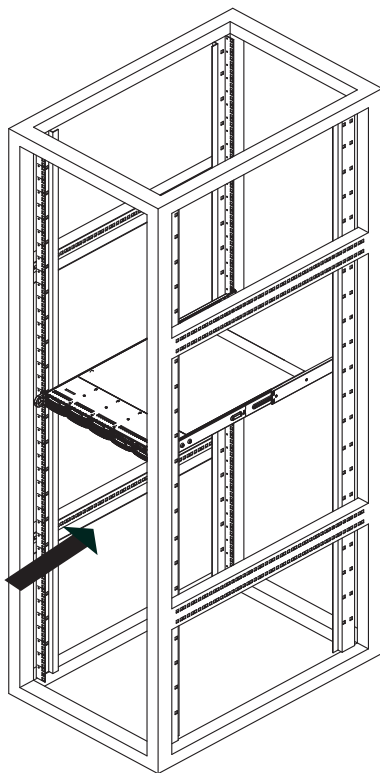


Figure 2-4. Installing the Outer Rails to the Rack



Installing the Chassis into a Rack (Figure 2-5)

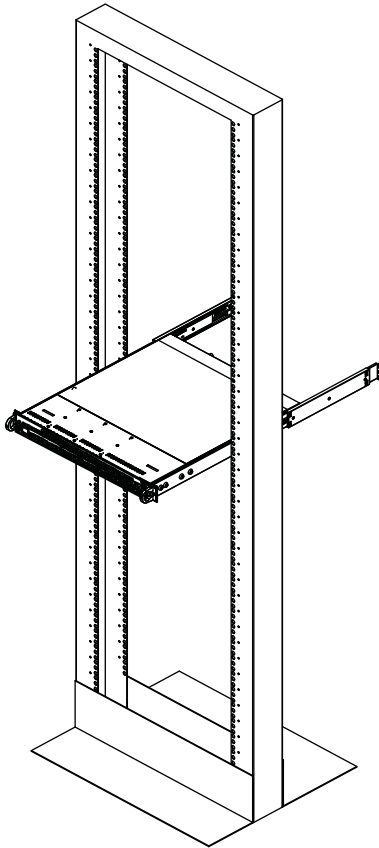
1. Confirm that chassis includes the inner rails and rail extensions . Also, confirm that the outer rails are installed on the rack.
2. Line chassis rails with the front of the rack rails.
3. Slide the chassis rails into the rack rails, keeping the pressure even on both sides (you may have to depress the locking tabs when inserting). When the server has been pushed completely into the rack, you should hear the locking tabs "click".
4. (Optional) Insert and tightening the thumbscrews that hold the front of the server to the rack.

Figure 2-5. Installing the Server into a Rack

Installing the Server into a Telco Rack

To install the SuperServer SuperServer 1027R-WRF into a Telco type rack, use two L-shaped brackets on either side of the chassis (four total). First, determine how far forward the server will extend out the front of the rack. Larger chassis should be positioned to balance the weight between front and back. If a bezel is included on your server, remove it. Then attach the two front brackets to each side of the chassis, then the two rear brackets positioned with just enough space to accommodate the width of the telco rack. Finish by sliding the chassis into the rack and tightening the brackets to the rack.

Figure 2-6. Installing the Server into a Telco Rack



2-6 Checking the Serverboard Setup

After you install the SuperServer 1027R-WRF in the rack, you will need to open the unit to make sure the serverboard is properly installed and all the connections have been made.

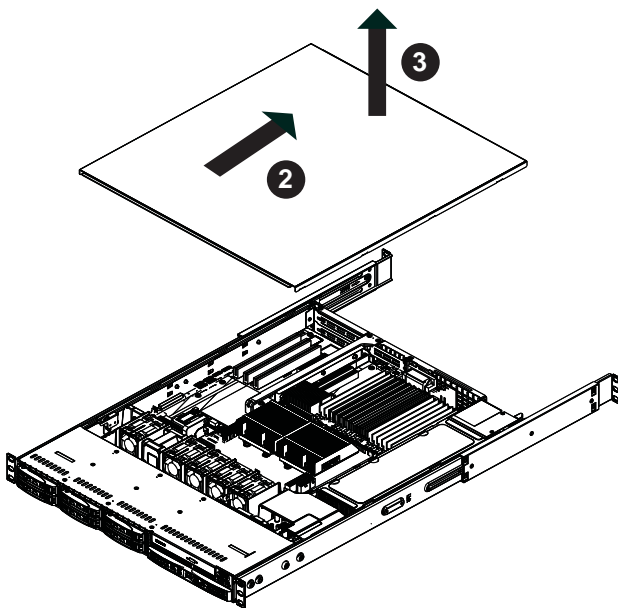
Removing the Chassis Cover (Figure 2-5)

1. Grasp the two handles on either side and pull the unit straight out until it locks (you will hear a "click").
2. Remove the screws securing the top cover to the chassis.
3. Slide the cover toward the rear of the chassis.
4. Lift the cover off the chassis.

Checking the Components

1. You should have one or two processors already installed into the serverboard. Each processor needs its own heatsink. See Chapter 5 for instructions on processor and heatsink installation.

Figure 2-5: Removing the Chassis Cover



2. Your SuperServer 1027R-WRF system may have come with system memory already installed. Make sure all DIMMs are fully seated in their slots. For details on adding system memory, refer to Chapter 5.
3. If desired, you can install add-on cards to the system. See Chapter 5 for details on installing PCI add-on cards.
4. Make sure all power and data cables are properly connected and not blocking the chassis airflow. See Chapter 5 for details on cable connections. Also, check the air seals for damage. The air seals are located under the blower fan and beneath the frame cross section that separates the drive bay area from the serverboard area of the chassis.

2-7 Checking the Drive Bay Setup

Next, you should check to make sure the hard drives have been properly installed and all connections have been made.

Checking the Drives

1. For servicing the hard drives, you will need to remove the top chassis cover.
2. If you need to remove or install hard drives, please refer to Chapter 6.

Checking the Airflow

1. Airflow is provided by four 4-cm counter-rotating fans. The system component layout was carefully designed to direct sufficient cooling airflow to the components that generate the most heat.
2. Note that all power and data cables have been routed in such a way that they do not block the airflow generated by the fans.

Providing Power

1. The last thing you must do is to provide input power to the system. Plug the power cord from the power supply unit into a high-quality power strip that offers protection from electrical noise and power surges. It is recommended that you use an uninterruptible power supply (UPS).
2. Finish by depressing the power button on the chassis control panel.

Notes

Chapter 3

System Interface

3-1 Overview

There are several LEDs on the control panel to keep you constantly informed of the overall status of the system as well as the three buttons described below.

3-2 Control Panel Buttons

There are three buttons located on the front of the chassis: a reset button, a power on/off button and a UID button.



Reset

Use the reset button to reboot the system.



Power

This is the main power button, which is used to apply or turn off the main system power. Turning off system power with this button removes the main power but keeps standby power supplied to the system.



UID

Depressing the UID (unit identifier) button illuminates an LED on both the front and rear of the chassis for easy system location in large stack configurations. The LED will remain on until the button is pushed a second time. Another UID button on the rear of the chassis serves the same function. See the table in Figure 3-1 for descriptions of UID LED states.

3-3 Control Panel LEDs

The control panel located on the front of the SC113TQ-R700WB chassis has five LEDs. These LEDs provide you with critical information related to different parts of the system. This section explains what each LED indicates when illuminated and any corrective action you may need to take.



Universal Information LED

When this LED blinks red quickly, it indicates a fan failure and when blinking red slowly a power failure. This LED will be blue when used for UID (Unit Identifier). When on continuously it indicates an overheat condition, which may be caused by cables obstructing the airflow in the system or the ambient room temperature being too warm. Check the routing of the cables and make sure all fans are present and operating normally. You should also check to make sure that the chassis covers are installed. Finally, verify that the heatsinks are installed properly (see Chapter 5). This LED will remain flashing or on as long as the indicated condition exists. See the table below for descriptions of the LED states.

Universal Information LED States	
State	Indication
Fast Blinking Red (1x/sec)	Fan Fail
Solid Red	CPU Overheat
Slow Blinking Red (1x/4 sec)	Power Fail
Solid Blue	Local UID Button Depressed
Blinking Blue	IPMI-Activated UID

Note: deactivating the UID LED must be performed in the same way it was activated. (If the UID LED was activated via IPMI, you can only turn the LED off via IPMI and not with the UID button.)

**NIC2**

Indicates network activity on LAN2 when flashing.

**NIC1**

Indicates network activity on LAN1 when flashing.

**HDD**

Indicates IDE channel activity when flashing.

**Power**

Indicates power is being supplied to the system's power supply units. This LED should normally be illuminated when the system is operating.

3-4 Hard Drive Carrier LEDs

Each hard drive carrier has two LEDs.

- **Green:** When illuminated, the green LED on the front of the drive carrier indicates drive activity. A connection to the SATA backplane enables this LED to blink on and off when that particular drive is being accessed.
- **Red:** The red LED indicates two states. When blinking, it indicates the drive is rebuilding. When solid, it indicates a drive failure. If a drive fails, you should be notified by your system management software. Please refer to Chapter 6 for instructions on replacing failed drives.

3-5 Power Supply LEDs

This chassis provides several options which may include hot-swappable, cold-swappable, and redundant power supplies. Some power supplies include an LED in the rear with the following definitions:

700W Power Supply LED

700W Power Supply LEDs	
State Indication	
Solid: Green	System is on.
Solid: Amber	System is off and plugged in or 5V stand by on.
Blinking: Amber (Only for 650W)	Power supply internal temperature has reached 63° Celsius, and will be shut down if the temperature reaches 70° Celsius.

- **Solid Green:** When illuminated, the green LED indicates that the power supply is on.
- **Solid Amber:** When illuminated, the amber LED indicates the power supply is plugged in and turned off, or the system is off but in an abnormal state.

Chapter 4

System Safety

4-1 Electrical Safety Precautions



Basic electrical safety precautions should be followed to protect yourself from harm and the SuperServer 1027R-WRF from damage:

- Be aware of the locations of the power on/off switch on the chassis as well as the room's emergency power-off switch, disconnection switch or electrical outlet. If an electrical accident occurs, you can then quickly remove power from the system.
- Do not work alone when working with high voltage components.
- Power should always be disconnected from the system when removing or installing main system components, such as the serverboard, memory modules and floppy drive. When disconnecting power, you should first power down the operating system first and then unplug the power cords. The unit has more than one power supply cord. Disconnect two power supply cords before servicing to avoid electrical shock.
- When working around exposed electrical circuits, another person who is familiar with the power-off controls should be nearby to switch off the power if necessary.
- Use only one hand when working with powered-on electrical equipment. This is to avoid making a complete circuit, which will cause electrical shock. Use extreme caution when using metal tools, which can easily damage any electrical components or circuit boards they come into contact with.
- Do not use mats designed to decrease static electrical discharge as protection from electrical shock. Instead, use rubber mats that have been specifically designed as electrical insulators.
- The power supply power cords must include a grounding plug and must be plugged into grounded electrical outlets.
- This product may be connected to an IT power system. In all cases, make sure that the unit is also reliably connected to Earth (ground).

- Serverboard Battery: **CAUTION** - There is a danger of explosion if the onboard battery is installed upside down, which will reverse its polarities (see Figure 4-1). This battery must be replaced only with the same or an equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.
- DVD-ROM Laser: **CAUTION** - this server may have come equipped with a DVD-ROM drive. To prevent direct exposure to the laser beam and hazardous radiation exposure, do not open the enclosure or use the unit in any unconventional way.
- Mainboard replaceable soldered-in fuses: Self-resetting PTC (Positive Temperature Coefficient) fuses on the mainboard must be replaced by trained service technicians only. The new fuse must be the same or equivalent as the one replaced. Contact technical support for details and support.

4-2 General Safety Precautions



Follow these rules to ensure general safety:

- Keep the area around the SuperServer 1027R-WRF clean and free of clutter.
- The SuperServer 1027R-WRF weighs approximately 33 lbs. (15 kg.) when fully loaded. When lifting the system, two people at either end should lift slowly with their feet spread out to distribute the weight. Always keep your back straight and lift with your legs.
- Place the chassis top cover and any system components that have been removed away from the system or on a table so that they won't accidentally be stepped on.
- While working on the system, do not wear loose clothing such as neckties and unbuttoned shirt sleeves, which can come into contact with electrical circuits or be pulled into a cooling fan.
- Remove any jewelry or metal objects from your body, which are excellent metal conductors that can create short circuits and harm you if they come into contact with printed circuit boards or areas where power is present.
- After accessing the inside of the system, close the system back up and secure it to the rack unit with the retention screws after ensuring that all connections have been made.

4-3 ESD Precautions



Electrostatic discharge (ESD) is generated by two objects with different electrical charges coming into contact with each other. An electrical discharge is created to neutralize this difference, which can damage electronic components and printed circuit boards. The following measures are generally sufficient to neutralize this difference before contact is made to protect your equipment from ESD:

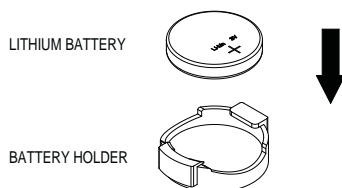
- Use a grounded wrist strap designed to prevent static discharge.
- Keep all components and printed circuit boards (PCBs) in their antistatic bags until ready for use.
- Touch a grounded metal object before removing the board from the antistatic bag.
- Do not let components or PCBs come into contact with your clothing, which may retain a charge even if you are wearing a wrist strap.
- Handle a board by its edges only; do not touch its components, peripheral chips, memory modules or contacts.
- When handling chips or modules, avoid touching their pins.
- Put the serverboard and peripherals back into their antistatic bags when not in use.
- For grounding purposes, make sure your computer chassis provides excellent conductivity between the power supply, the case, the mounting fasteners and the serverboard.

4-4 Operating Precautions



Care must be taken to assure that the chassis cover is in place when the SuperServer 1027R-WRF is operating to assure proper cooling. Out of warranty damage to the system can occur if this practice is not strictly followed.

Figure 4-1. Installing the Onboard Battery



Please handle used batteries carefully. Do not damage the battery in any way; a damaged battery may release hazardous materials into the environment. Do not discard a used battery in the garbage or a public landfill. Please comply with the regulations set up by your local hazardous waste management agency to dispose of your used battery properly.

Chapter 5

Advanced Serverboard Setup

This chapter covers the steps required to install processors and heatsinks to the X9DRW-iF serverboard, connect the data and power cables and install add-on cards. All serverboard jumpers and connections are described and a layout and quick reference chart are included in this chapter. Remember to close the chassis completely when you have finished working on the serverboard to protect and cool the system sufficiently.

5-1 Handling the Serverboard

Static electrical discharge can damage electronic components. To prevent damage to printed circuit boards, it is important to handle them very carefully (see Chapter 4). Also note that the size and weight of the serverboard can cause it to bend if handled improperly, which may result in damage. To prevent the serverboard from bending, keep one hand under the center of the board to support it when handling.

The following measures are generally sufficient to protect your equipment from static discharge.

Precautions

- Use a grounded wrist strap designed to prevent static discharge.
- Touch a grounded metal object before removing any board from its antistatic bag.
- Handle a board by its edges only; do not touch its components, peripheral chips, memory modules or gold contacts.
- When handling chips or modules, avoid touching their pins.
- Put the serverboard, add-on cards and peripherals back into their antistatic bags when not in use.

Unpacking

The serverboard is shipped in antistatic packaging to avoid static damage. When unpacking the board, make sure the person handling it is static protected.

5-2 Processor and Heatsink Installation

Caution! When handling the processor package, avoid placing direct pressure on the label area.

Caution: Always connect the power cord last, and always remove it before adding, removing or changing any hardware components. Make sure that you install the processor into the CPU socket before you install the CPU heatsink.

Caution! If you buy a CPU separately, make sure that you use an Intel-certified multi-directional heatsink only.

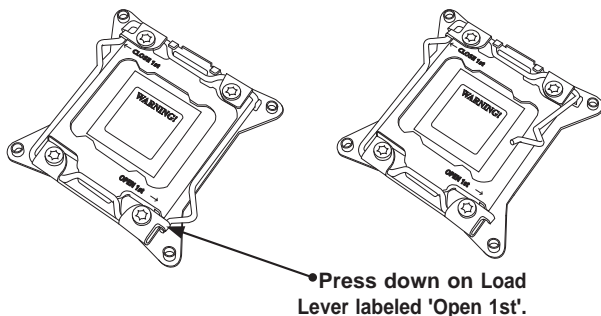
Caution: Make sure to install the system board into the chassis before you install the CPU heatsink.

Caution: When receiving a server board without a processor pre-installed, make sure that the plastic CPU socket cap is in place and none of the socket pins are bent; otherwise, contact your retailer immediately.

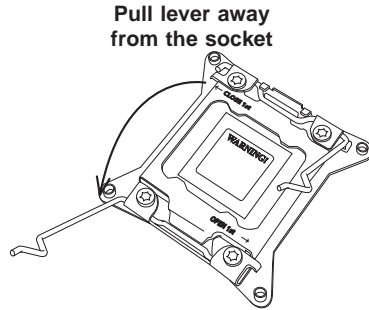
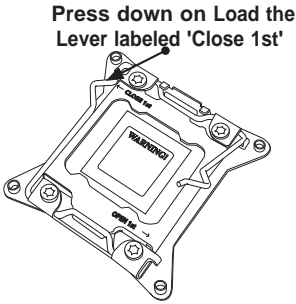
Refer to the Supermicro website for updates on CPU support.

Installing the LGA2011 Processor

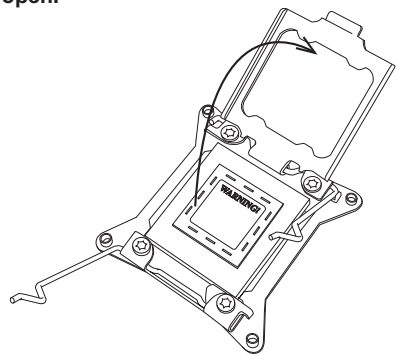
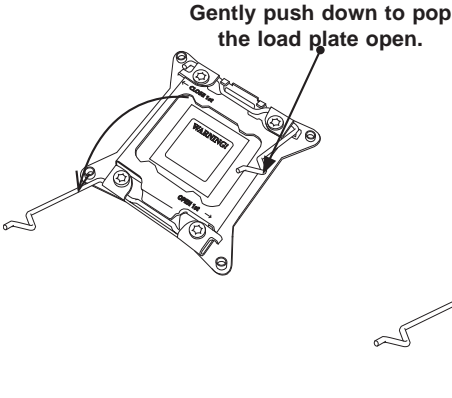
1. There are two load levers on the LGA2011 socket. To open the socket cover, first press and release the load lever labeled 'Open 1st'.



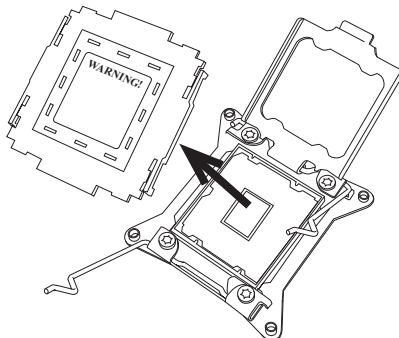
2. Press the second load lever labeled 'Close 1st' to release the load plate that covers the CPU socket from its locking position.



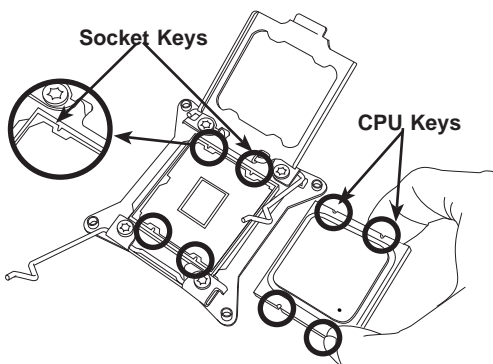
3. With the lever labeled 'Close 1st' fully retracted, gently push down on the 'Open 1st' lever to open the load plate. Lift the load plate to open it completely.



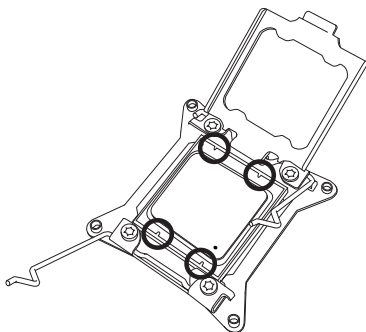
4. Using your thumb and the index finger, remove the 'WARNING' plastic cap from the socket.



5. Use your thumb and index finger to hold the CPU on its edges. Align the CPU keys, which are semi-circle cutouts, against the socket keys.

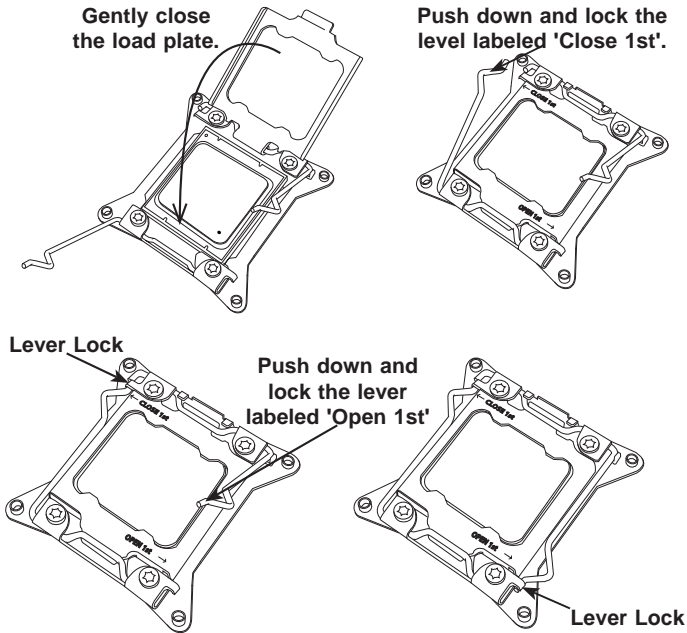


6. Once they are aligned, carefully lower the CPU straight down into the socket. (Do not drop the CPU on the socket. Do not move the CPU horizontally or vertically. Do not rub the CPU against the surface or against any pins of the socket to avoid damaging the CPU or the socket.)



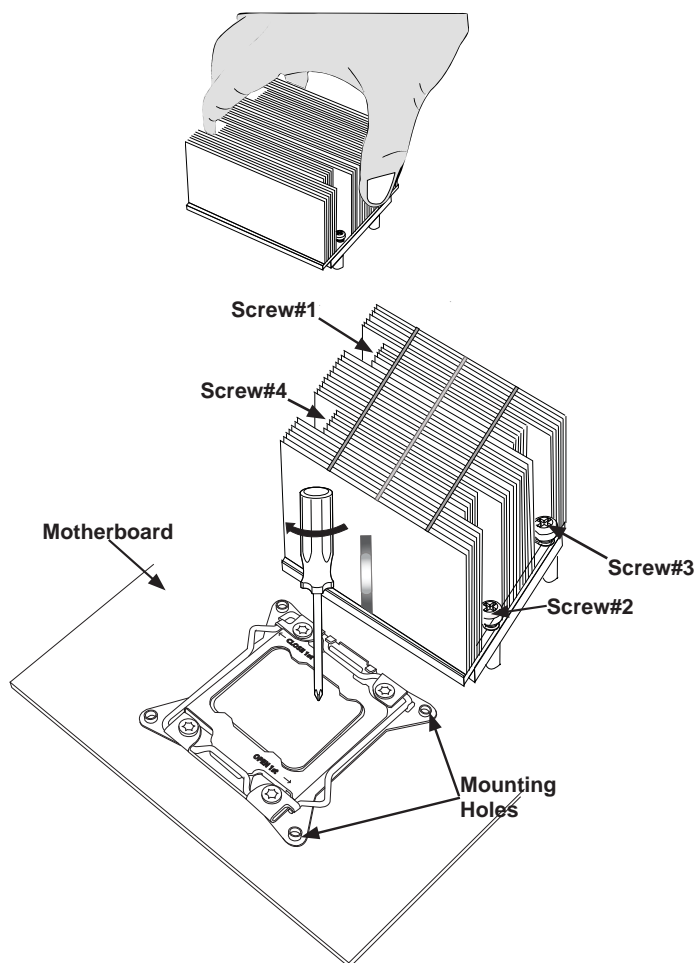
Caution: You can only install the CPU inside the socket in one direction. Make sure that it is properly inserted into the CPU socket before closing the load plate. If it doesn't close properly, do not force it as it may damage your CPU. Instead, open the load plate again and double-check that the CPU is aligned properly.

7. With the CPU inside the socket, inspect the four corners of the CPU to make sure that the CPU is properly installed.
8. Close the load plate with the CPU inside the socket. Lock the lever labeled 'Close 1st' first, then lock the lever labeled 'Open 1st' second. Use your thumb to gently push the load levers down to the lever locks.



Installing a Passive CPU Heatsink

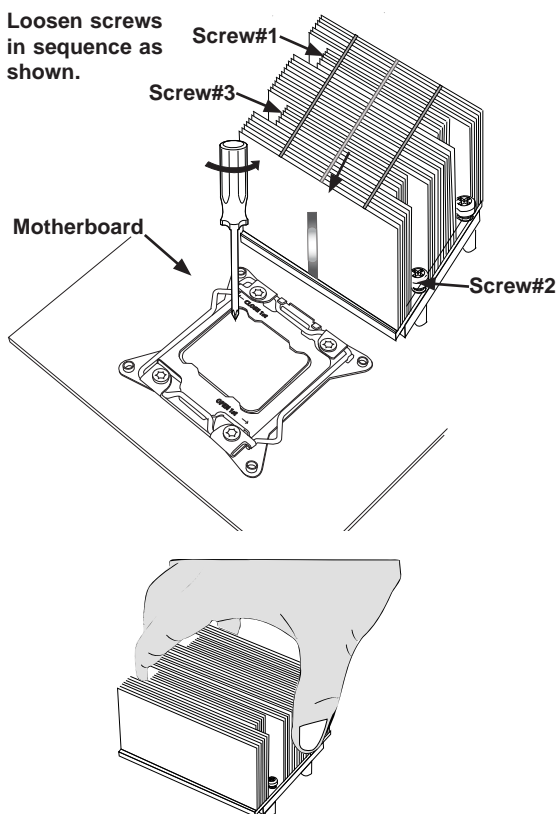
1. Do not apply any thermal grease to the heatsink or the CPU die -- the required amount has already been applied.
2. Place the heatsink on top of the CPU so that the four mounting holes are aligned with those on the Motherboard's and the Heatsink Bracket underneath.
3. Screw in two diagonal screws (i.e., the #1 and the #2 screws) until just snug (-do not over-tighten the screws to avoid possible damage to the CPU.)
4. Finish the installation by fully tightening all four screws.



Removing the Heatsink

Caution: We do not recommend that the CPU or the heatsink be removed. However, if you do need to uninstall the heatsink, please follow the instructions below to uninstall the heatsink to prevent damage done to the CPU or the CPU socket.

1. Unscrew the heatsink screws from the motherboard in the sequence as shown in the illustration below.
2. Gently wriggle the heatsink to loosen it from the CPU. (Do not use excessive force when wriggling the heatsink!)
3. Once the heatsink is loosened, remove the heatsink from the CPU socket.
4. Remove the used thermal grease and clean the surface of the CPU and the heatsink, Reapply the proper amount of thermal grease on the surface before reinstalling the CPU and the heatsink.



5-3 Connecting Cables

Now that the processors are installed, the next step is to connect the cables to the serverboard. These include the data (ribbon) cables for the peripherals and control panel and the power cables.

Connecting Data Cables

The cables used to transfer data from the peripheral devices have been carefully routed in preconfigured systems to prevent them from blocking the flow of cooling air that moves through the system from front to back. If you need to disconnect any of these cables, you should take care to reroute them as they were originally after reconnecting them (make sure the red wires connect to the pin 1 locations). If you are configuring the system, keep the airflow in mind when routing the cables.

The following data cables (with their connector locations noted) should be connected. See the serverboard layout diagram in this chapter for connector locations.

- Control Panel cable (JF1, see next page)
- (Optional) Six SATA cables (i-SATA 0~5) (**Note:** these cables are not provided or connected with the SuperServer 1027R-WRF)

Connecting Power Cables

The X9DRW-iF has a pre-connected 24-pin primary power supply connector designated "JPW1" for connection to the ATX power supply. This cable connects the power supply to the JPW1 connector on the serverboard. See the Connector Definitions section in this chapter for power connector pin definitions.

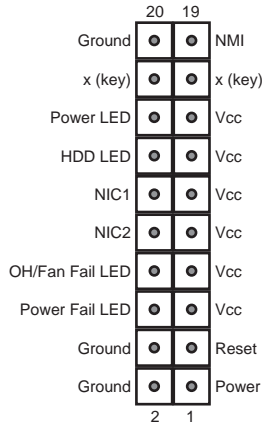
In addition, your power supply must be connected to the two 8-pin and one 4-pin Processor Power connectors at JPW3/3 and JPW4.

Connecting the Control Panel

The pre-connected JF1 contains header pins for various front control panel connectors. See Figure 5-1 for the pin locations of the various front control panel buttons and LED indicators. Even and odd numbered pins are on opposite sides of each header.

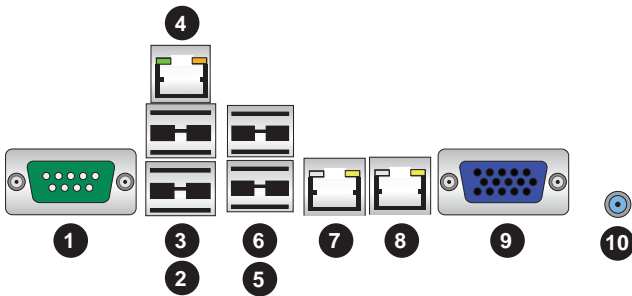
All JF1 wires have been bundled into single keyed ribbon cable to simplify their connection. The red wire in the ribbon cable plugs into pin 1 of JF1. Connect the other end of the cable to the Control Panel printed circuit board, located just behind the system status LEDs in the chassis.

See the Connector Definitions section in this chapter for details and pin descriptions of JF1.

Figure 5-1. Front Control Panel Header Pins (JF1)

5-4 I/O Ports

The I/O ports are color coded in conformance with the PC 99 specification. See Figure 5-2 below for the colors and locations of the various I/O ports.

Figure 5-2. Rear Panel I/O Ports

Rear I/O Ports	
1. COM Port 1 (Turquoise)	6. Back Panel USB Port 3
2. Back Panel USB Port 0	7. Gigabit LAN 1
3. Back Panel USB Port 1	8. Gigabit LAN 2
4. IPMI_Dedicated LAN	9. Back Panel VGA (Blue)
5. Back Panel USB Port 2	10. UID Button

5-5 Installing Memory

Caution! Exercise extreme care when installing or removing DIMM modules to prevent any possible damage.

Memory Support

The X9DRW-iF supports up to 512 GB of registered ECC 512 MB, 1 GB, 2 GB, 4 GB, 8 GB, 16 GB or 32 GB size SDRAM in sixteen (16) DIMM slots of up to DDR3 1600/1333/1066/800 MHz speed. See the following table for memory installation.

Memory speed support is dependent on the type of CPU used on the board.

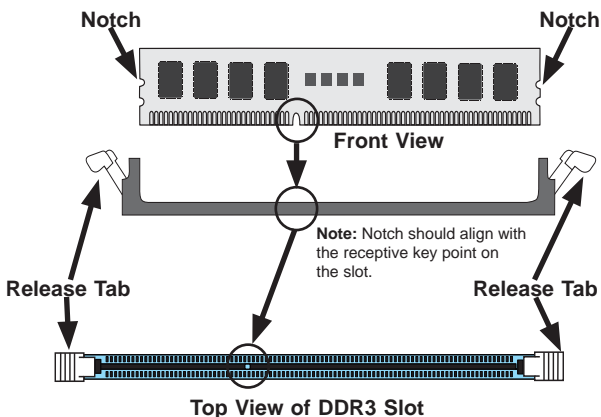
Installing Memory Modules

1. Insert the desired number of DIMMs into the memory slots, starting with DIMM 1A. For best memory performance, please install memory modules of the same type and same speed on the memory slots as indicated on the tables below.
 2. Insert each DIMM module vertically into its slot. Pay attention to the notch along the bottom of the module to avoid installing incorrectly (see Figure 5-3).
 3. Gently press down on the DIMM module until it snaps into place in the slot.
- Repeat for all modules.

Figure 5-3. Installing DIMM into Slot

To Install: Insert module vertically and press down until it snaps into place. Pay attention to the alignment notch at the bottom.

To Remove: Use your thumbs to gently push the release tabs near both ends of the module. This should release it from the slot.



Processors and their Corresponding Memory Modules								
CPU#	Corresponding DIMM Modules							
CPU 1	P1-DIMMA1	P1-DIMMA2	P1-DIMMB1	P1-DIMMB2	P1-DIMMC1	P1-DIMMC2	P1-DIMMD1	P1-DIMMD2
CPU2	P2-DIMME1	P2-DIMME2	P2-DIMMF1	P2-DIMMF2	P2-DIMMG1	P2-DIMMG2	P2-DIMMH1	P2-DIMMH2

Processor and Memory Module Population	
Number of CPUs+DIMMs	CPU and Memory Population Configuration Table (*For memory to work proper, please install DIMMs in pairs)
1 CPU & 2 DIMMs	CPU1 P1-DIMMA1/P1-DIMMB1
1 CPU & 4 DIMMs	CPU1 P1-DIMMA1/P1-DIMMB1, P1-DIMMC1/P1-DIMMD1
1 CPU & 5-8 DIMMs	CPU1 P1-DIMMA1/P1-DIMMB1, P1-DIMMC1/P1-DIMMD1, P1-DIMMA2/P1-DIMMB2, P1-DIMMC2/P1-DIMMD2
2 CPUs & 4 DIMMs	CPU1 + CPU2 P1-DIMMA1/P1-DIMMB1, P2-DIMME1/P2-DIMMF1
2 CPUs & 6 DIMMs	CPU1 + CPU2 P1-DIMMA1/P1-DIMMB1, P2-DIMME1/P2-DIMMF1, P1-DIMMC1/P1-DIMMD1
2 CPUs & 8 DIMMs	CPU1 + CPU2 P1-DIMMA1/P1-DIMMB1, P2-DIMME1/P2-DIMMF1, P1-DIMMC1/P1-DIMMD1, P2-DIMMG1/P2-DIMMH1
2 CPUs & 9-12 DIMMs	CPU1/CPU2 P1-DIMMA1/P1-DIMMB1, P2-DIMME1/P2-DIMMF1, P1-DIMMC1/P1-DIMMD1, P2-DIMMG1/P2-DIMMH1, P1-DIMMA2/P1-DIMMB2, P2-DIMME2/P2-DIMMF2
2 CPUs & 13 DIMMs-16 DIMMs	CPU1/CPU2 P1-DIMMA1/P1-DIMMB1, P2-DIMME1/P2-DIMMF1, P1-DIMMC1/P1-DIMMD1, P2-DIMMG1/P2-DIMMH1, P1-DIMMA2/P1-DIMMB2, P2-DIMME2/P2-DIMMF2, P1-DIMMC2/P1-DIMMD2, P2-DIMMG2/P2-DIMMH2

UDIMM Support on the Intel E5-2600 Series Processor Platform			
DIMMs Populated per DDR Channel	UDIMM Type (Unb. DIMM)	POR Speeds (in MHz)	Ranks per DIMM (Any Combination)
1	ECC/Non-ECC DDR3	1066, 1333	SR, DR
2	ECC/Non-ECC DDR3	1066, 1333	SR, DR

RDIMM Support on the Intel E5-2600 Series Processor Platform			
DIMMs Populated per DDR Channel	RDIMM Type (Reg. DIMM)	POR Speeds (in MHz)	Ranks per DIMM (Any Combination)
1	Reg. ECC DDR3	1066, 1333, 1600	SR, DR
2	Reg. ECC DDR3	1066, 1333, 1600	SR, DR
1	Reg. ECC DDR3	1066	QR
2	Reg. ECC DDR3	800	QR

LRDIMM Support on the Intel E5-2600 Series Processor Platform			
DIMMs Populated per DDR Channel	LRDIMM Type (Load Reduced DIMM)	POR Speeds (in MHz)	Ranks per DIMM (Any Combination)
1	LR ECC DDR3	1066, 1333	QR
2	LR ECC DDR3	1066, 1333	QR

Other Notes and Restrictions

- For the memory modules to work properly, please install DIMM modules in pairs (with even number of DIMMs installed).
- All channels in a system will run at the fastest common frequency.
- Due to memory allocation to system devices, the amount of memory that remains available for operational use will be reduced when 4 GB of RAM is used. The reduction in memory availability is disproportional. See the following table for details.

Possible System Memory Allocation & Availability		
System Device	Size	Physical Memory Available (4 GB Total System Memory)
Firmware Hub flash memory (System BIOS)	1 MB	3.99 GB
Local APIC	4 KB	3.99 GB
Area Reserved for the chipset	2 MB	3.99 GB
I/O APIC (4 Kbytes)	4 KB	3.99 GB
PCI Enumeration Area 1	256 MB	3.76 GB
PCI Express (256 MB)	256 MB	3.51 GB
PCI Enumeration Area 2 (if needed) -Aligned on 256-M boundary-	512 MB	3.01 GB
VGA Memory	16 MB	2.85 GB
TSEG	1 MB	2.84 GB
Memory available for the OS & other applications		2.84 GB

5-6 Adding PCI Expansion Cards

PCI Expansion Slots

One riser card is used to support PCI expansion cards in the system. The riser card can support two full-height, 6.6" length PCI-Express x16 expansion cards.

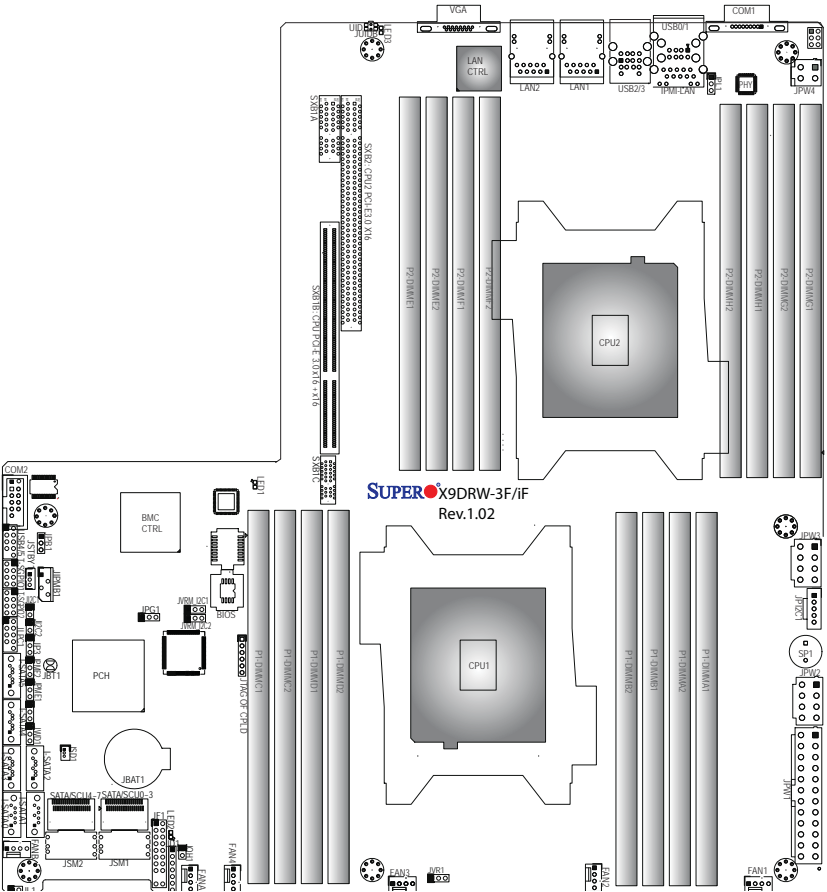
Installing a PCI Add-on Card

1. Remove the chassis cover.
2. Release the locking tab that corresponds to the PCI slot shield for the slot you wish to populate.
3. Insert the expansion card into the riser card, pushing down with your thumbs evenly on both sides of the card.
4. Slide the add-on card into the riser card and attach the add-on card bracket in place of the PCI slot shield.
5. Secure the add-on card by closing the PCI slot shield lever.
6. Connect cables to the add-on card as necessary.

Note: If the left side riser is with 2 or more x8 PCI-E slots make sure an installed card on the left side riser is detected. If it is not, then go to the system's BIOS Setup and in Advanced/ PCI/PnP Configuration /SXB1 Configuration BIOS setting select the [2x8] option. Then save the BIOS setting changes and reboot the system.

5-7 Serverboard Details

Figure 5-4. X9DRW-iF Serverboard Layout
(not drawn to scale)



Notes:

- Jumpers/LED Indicators not indicated are for testing only.
- Use only the correct type of onboard CMOS battery as specified by the manufacturer. Do not install the onboard battery upside down to avoid possible explosion. See Chapter 4 for correct battery type.

X9DRW-iF Quick Reference

Jumper	Description	Default Setting
JBT1	Clear CMOS	See Chapter 3
JI2C1/JI2C2	SMB to PCI-E Slots	Open (Normal)
JPB1	BMC Enable	Pins 1-2 (Enabled)
JPG1	VGA Enable	Pins 1-2 (Enabled)
JPL1	LAN1/LAN2 Enable	Pins 1-2 (Enabled)
JWD1	Watch Dog	Pins 1-2 (Reset)

LED	Description	State	Status
LED1	BMC	Green: Blinking	Normal
LED2	Power LED	Green: On	SB Power On
LED3	UID LED	Blue: On	Unit Identified

Connector	Description
COM1/COM2	Backplane COM Port1/Front Accessible COM2 Header
FAN1~4,FANA, FANB	CPU/System Fan Headers
I-SATA 0~5	Intel PCH SATA Connectors 0~5
JBAT1	Onboard Battery (See Chpt. 4 for Used Battery Disposal)
JD1	Speaker/Power LED Connector (Pins 1~3: PWR LED, Pins 6~7: Onboard Buzzer/Pins 4~7: External Speaker)
JF1	Front Panel Control Header
JIPMB1	4-pin External BMC I2C Header (for an IPMI Card)
JL1	Chassis Intrusion
JLPC1	Port80 Header
JOH1	Overheat/Fan Fail LED
JPI2C1	Power Supply SMBbus I2C Header
JPW1	ATX 24-Pin Power Connector (See Warning on Pg. 1-6)
JPW2/3	12V 8-Pin Power Connectors (See Warning on Pg. 1-6)
JPW4	12V 4-Pin Power Connector (See Warning on Pg. 1-6)
JSD1	SATA DOM (Device_On_Module) Power Connector
JSTBY1	Standby Power Connector
LAN1/2	G-bit Ethernet Ports 1/2
(IPMI) LAN	IPMI_Dedicated LAN
SATA/SCU 0~3, 4~7	Serial_Link SATA/SCU Connections 0~3, 4~7 (for X9DRW-3F), SCU 0~3 (for X9DRW-iF)
SP1	Onboard Buzzer (Internal Speaker)
SXB1A	SMC-Proprietary SPEC Slot (See Note 1 below.)
SXB1B	SMC-Proprietary PCI-E 3.0 x16 + x16 Add-on Card Slot (Left) (See Note 1 below.)
SXB1C	SMC-Proprietary SPEC Slot (See Note 1 below.)
SXB2	SMC-Proprietary PCI-E 3.0 x16 Add-on Card Slot (Right) (See Note 2)
T-SGPI0 1/2	Serial-Link General_Purpose IO Headers 1/2
USB 0/1, 2/3	Back Panel USB 0/1, 2/3 Ports
USB 4/5	Front Panel Accessible USB 4/5 Connections
UID Switch	UID (Unit Identifier) Switch

Note 1: For SXB1A/SXB1B/SXB1C PCI-Exp. slots to work properly, please use an SMC-proprietary riser card (eg. RSC-RIUW-2E16) in the slots.

Note 2: For SXB2 PCI-Exp. slot to work properly, please use the SMC-proprietary riser card RSC-R2UW-2EBR or RSC-R1UW-E8R in the slot.

Note 3: Components not documented are reserved for internal use only.

Caution! To prevent damage to the power supply or motherboard, please use a power supply that contains a 24-pin, two 8-pin and one 4-pin power connectors. Be sure to connect these power supply connectors to the 24-pin power connector (JPW1), the two 8-pin power connectors (JPW2, JPW3) and the one 4-pin power connector (JPW4) on the motherboard. Failure in doing so will void the manufacturer warranty on your power supply and motherboard.

5-8 Connector Definitions

Power Connectors

A 24-pin main power supply connector(JPW1), two 8-pin CPU power connectors (JPW2/JPW3) and a 4-pin power connector are located on the motherboard. These power connectors meet the SSI EPS 12V specification. These power connectors must also be connected to your power supply. See the table on the right for pin definitions.

Warning: To provide adequate power supply to the motherboard, be sure to connect the 24-pin ATX PWR (JPW1), two 8-pin PWR connectors (JPW2/JPW3) and the 4-pin PWR connector (JPW4) to the power supply. Failure to do so will void the manufacturer warranty on your power supply and motherboard.

ATX Power 24-pin Connector Pin Definitions (JPW1)			
Pin#	Definition	Pin #	Definition
13	+3.3V	1	+3.3V
14	-12V	2	+3.3V
15	COM	3	COM
16	PS_ON	4	+5V
17	COM	5	COM
18	COM	6	+5V
19	COM	7	COM
20	Res (NC)	8	PWR_OK
21	+5V	9	5VSB
22	+5V	10	+12V
23	+5V	11	+12V
24	COM	12	+3.3V

12V 8-pin PWR Connector Pin Definitions (JPW2/3)	
Pins	Definition
1 through 4	Ground
5 through 8	+12V

Required Connections

PW_ON Connector

The Power Button connection is located on pins 1 and 2 of JF1. Momentarily contacting both pins will power on/off the system. This button can also be configured to function as a suspend button (with a setting in the BIOS - See Chapter 5). To turn off the power when the system is in suspend mode, press the button for 4 seconds or longer. Refer to the table on the right for pin definitions.

Power Button Pin Definitions (JF1)	
Pin#	Definition
1	PW_ON
2	Ground

Reset Connector

The reset connector is located on pins 3 and 4 of JF1 and attaches to the reset switch on the computer chassis. See the table on the right for pin definitions.

Reset Button Pin Definitions (JF1)	
Pin#	Definition
3	Reset
4	Ground

Power Fail LED

The Power Fail LED connection is located on pins 5 and 6 of JF1. Refer to the table on the right for pin definitions.

PWR Fail LED Pin Definitions (JF1)	
Pin#	Definition
5	3.3V
6	PWR Supply Fail

Overheat/Fan Fail LED (OH)

Connect an LED cable to pins 7 and 8 of Front Control Panel to use the Overheat/Fan Fail/Power Fail and UID LED connections. The Red LED on pin 7 provides warnings of overheat, fan failure or power failure. The Blue LED on pin 8 works as the front panel UID LED indicator. The Red LED takes precedence over the Blue LED by default. Refer to the table on the right for pin definitions.

OH/Fan Fail/ PWR Fail/Blue_ UID LED Pin Definitions (JF1)	
Pin#	Definition
7	Red_LED-Cathode/OH/Fan Fail/Power Fail5.5V.SB
8	Blue_UID LED

OH/Fan Fail/PWR Fail LED Status (Red LED)	
State	Indication
Off	Normal
On	Overheat
Flashing	Fan Fail

NIC1 (LAN1) LED

The NIC (Network Interface Controller) LED connections for GLAN port 1 are located on pins 11 and 12 of JF1, and the LED connection for GLAN Port 2 are on Pins 9 and 10. Attach the NIC LED cables here to display network activity. Refer to the table on the right for pin definitions.

NIC1 LED Pin Definitions (JF1)	
Pin#	Definition
9	NIC 2 Activity LED
10	NIC 2 Link LED
11	NIC 1 Activity LED
12	NIC 1 Link LED

HDD LED

The HDD LED connection is located on pins 13 and 14 of JF1. Attach the hard drive LED cable here to display disk activity (for any hard drives on the system, including SAS, Serial ATA and IDE). See the table on the right for pin definitions

HDD LED Pin Definitions (JF1)	
Pin#	Definition
13	3.3V Standby
14	HD Active

Power On LED

The Power On LED connector is located on pins 15 and 16 of JF1. This connection is used to provide LED indication of power being supplied to the system. See the table on the right for pin definitions.

Power LED Pin Definitions (JF1)	
Pin#	Definition
15	3.3V
16	PWR LED

NMI Button

The non-maskable interrupt button header is located on pins 19 and 20 of JF1. Refer to the table on the right for pin definitions.

NMI Button Pin Definitions (JF1)	
Pin#	Definition
19	Control
20	Ground

Video Connection

One video (VGA) port (VGA1) is located next to LAN Port 2 on the I/O backplane. Refer to the board layout below for the location.

Universal Serial Bus (USB)

Four Universal Serial Bus ports (USB 0/1, 2/3) are located on the I/O back panel. In addition, one USB header, located next to COM2 port, provides two front-accessible USB connections (USB 4/5). (Cables are not included). See the tables on the right for pin definitions.

FP USB (4/5) Pin Definitions			
USB 4, 8, 10, 6, 7 Pin # Definition		USB 5, 9, 11 Pin # Definition	
1	+5V	1	+5V
2	PO-	2	PO-
3	PO+	3	PO+
4	Ground	4	Ground
5	NC	5	Key

(NC = No connection)

Backplane USB (0/1, 2/3) Pin Definitions	
Pin#	Definition
1	+5V
2	PO-
3	PO+
4	Ground
5	NA

Ethernet Ports

Two Gigabit Ethernet ports (LAN1/2) are located on the I/O backplane on the motherboard to provide internet connections. In addition, an IPMI_Dedicated LAN, located above USB 0/1 ports on the backplane, provides KVM support for IPMI 2.0. All these ports accept RJ45 type cables.



LAN Ports Pin Definition (LAN 1/2)			
Pin#	Definition	Pin#	Definition
1	P2V5SB	10	SGND
2	TD0+	11	Act LED
3	TD0-	12	P3V3SB
4	TD1+	13	Link 100 LED (Yellow, +3V3SB)
5	TD1-	14	Link 1000 LED (Yellow, +3V3SB)
6	TD2+	15	Ground
7	TD2-	16	Ground
8	TD3+	17	Ground
9	TD3-	18	Ground

(NC = No Connection)

Chassis Intrusion

A Chassis Intrusion header is located at JL1 on the motherboard. Attach an appropriate cable from the chassis to inform you of a chassis intrusion when the chassis is opened.

Chassis Intrusion Pin Definitions (JL1)	
Pin#	Definition
1	Intrusion Input
2	Ground

Serial Ports

Two COM connections (COM1 & COM2) are located on the motherboard. COM1 is located on the Backplane I/O panel. COM2, located next to Front Accessible USB 4/5, is used to provide front access serial support. See the table on the right for pin definitions.

Serial Port Pin Definitions (COM1/COM2)			
Pin #	Definition	Pin #	Definition
1	DCD	6	DSR
2	RXD	7	RTS
3	TXD	8	CTS
4	DTR	9	RI
5	Ground	10	NC

(NC = No connection)

Fan Headers

This motherboard has six system/CPU fan headers (Fan 1~Fan 4, Fan A, Fan B) on the motherboard. All these 4-pin fans headers are backward compatible with the traditional 3-pin fans. However, fan speed control is available for 4-pin fans only. The fan speeds are controlled by Thermal Management via Hardware Monitoring in IPMI. (See Chapter 5 for more details.) See the table on the right for pin definitions.

Fan Header Pin Definitions	
Pin#	Definition
1	Ground
2	+12V
3	Tachometer
4	PWR Modulation

Power LED/Speaker

On JD1 header, pins 1-3 are used for power LED indication, and pins 4-7 are for the speaker. See the tables on the right for pin definitions. Please note that the speaker connector pins (4-7) are used with an external speaker. If you wish to use the onboard speaker, you should close pins 6-7 with a jumper.

PWR LED Connector Pin Definitions (JD1)	
Pin Setting	Definition
Pin 1	Anode (+)
Pin2	Cathode (-)
Pin3	NA

Speaker Connector Pin Definitions	
Pin Setting	Definition
Pins 4~7	External Speaker
Pins 6~7	Internal Speaker (Default)

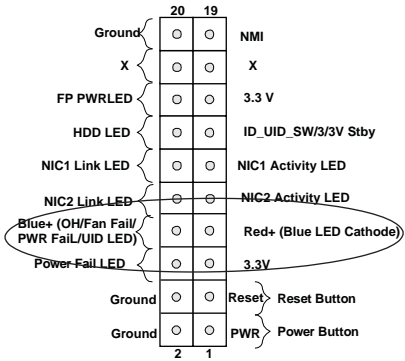
Unit Identifier Switch

A Unit Identifier (UID) Switch and two LED Indicators are located on the motherboard. The UID Switch is located next to the VGA port. The Rear UID LED (LED3) is located next to the UID Switch. The Front Panel UID LED is located at Pins 7/8 of the Front Control Panel at JF1. Connect a cable to Pin 8 on JF1 for Front Panel UID LED indication. When you press the UID switch, both Rear UID LED and Front Panel UID LED Indicators will be turned on. Press the UID switch again to turn off both LED Indicators. These UID Indicators provide easy identification of a system unit that may be in need of service.

Note: UID can also be triggered via IPMI on the motherboard. For more information on IPMI, please refer to the IPMI User's Guide posted on our Website @<http://www.supermicro.com>.

UID Switch	
Pin#	Definition
1	Ground
2	Ground
3	Button In
4	Ground

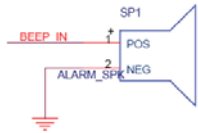
UID LED Status		
Color/State OS		Status
Blue: On	Windows OS	Unit Identified
Blue: Blinking	Linux OS	Unit Identified



Internal Speaker

The Internal Speaker, located at SP1, can be used to provide audible indications for various beep codes. See the table on the right for pin definitions. Refer to the layout below for the locations of the Internal Buzzer (SP1).

Internal Buzzer (SP1) Pin Definition		
Pin#	Definitions	
Pin 1	Pos. (+)	Beep In
Pin 2	Neg. (-)	Alarm Speaker



Overheat LED/Fan Fail

The JOH1 header is used to connect an LED indicator to provide warnings of chassis overheating and fan failure. This LED will blink when a fan failure occurs. Refer to the tables on right for pin definitions.

Overheat LED Pin Definitions (JOH1)	
Pin#	Definition
1	VDC
2	OH Active

OH/Fan Fail LED Status	
State	Message
Solid	Overheat
Blinking	Fan Fail

Power SMB (I²C) Connector

Power System Management Bus (I²C) Connector (JI2C1) monitors power supply, fan and system temperatures. See the table on the right for pin definitions.

PWR SMB Pin Definitions (JI2C1)	
Pin#	Definition
1	Clock
2	Data
3	PWR Fail
4	Ground
5	+3.3V

Port 80 Header

A Port 80 header, located at JLPC1, provides Port 80 support. Port 80 is an "Ask and Respond" port between a client machine and a host server. Port 80 allows the HTML (Hyper Text Markup Language) codes to be translated into web page displays so that you will see the web pages instead of the HTML codes when you browse the internet. See the table on the right for pin definitions.

Port 80 Header Pin Definitions	
Pin #	Definition
1	+3.3V
2	LFRAME#
3	LCLK
4	LAD 3
5	LRESET#
6	LAD2
7	Ground
8	LAD0

IPMB

A System Management Bus header for IPMI 2.0 is located at JIPMB1. Connect the appropriate cable here to use the IPMB I²C connection on your system.

IPMB Header Pin Definitions (JIPMB1)	
Pin#	Definition
1	Data
2	Ground
3	Clock
4	No Connection

T-SGPIO 1/2 Headers

Two SGPIO (Serial-Link General Purpose Input/Output) headers are located on the motherboard. These headers support Serial_Link interface for onboard SATA connections. See the table on the right for pin definitions.

SGPIO Header Pin Definitions (T-SGPIO1/T-SGPIO2)			
Pin#	Definition	Pin#	Definition
1	NC	2	Data In
3	Ground	4	Data Out
5	Load	6	Ground
7	Clock	8	NC

(NC = No Connection)

DOM Power Connector

A power connector for SATA DOM (Disk_On_Module) devices is located at JSD1. Connect an appropriate cable here to provide power support for your DOM devices.

DOM Power Connector Pin Definitions	
Pin#	Definition
1	+5V
2	Ground
3	Ground

Standby Power Connector

The Standby Power connection header is located at JSTBY1 on the motherboard. See the table on the right for pin definitions. (You must also have a cable to use this feature.)

Standby Power Pin Definitions	
Pin#	Definition
1	+5V Standby
2	Ground
3	Wake-up

Legacy Wake-On-LAN Header (JSTBY)

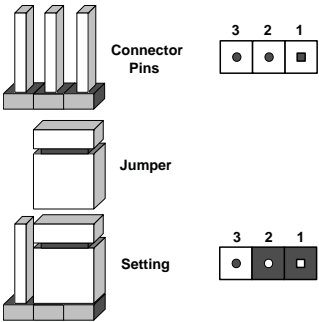
The onboard LAN ports do not need a WOL header to support their Wake-On-LAN function. Instead, the legacy WOL header was preserved (JSTBY) to provide convenience for some embedded customers who need an internal power source from the board. See the table on the right for pin definitions.

Legacy Wake-On-LAN Header Pin Definitions (JSTBY)	
Pin#	Definition
1	+5V Standby
2	Ground
3	Wake-up (signal)

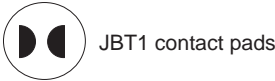
5-9 Jumper Settings

Explanation of Jumpers

To modify the operation of the motherboard, jumpers can be used to choose between optional settings. Jumpers create shorts between two pins to change the function of the connector. Pin 1 is identified with a square solder pad on the printed circuit board. See the diagram at right for an example of jumping pins 1 and 2. Refer to the motherboard layout page for jumper locations.



Note: On two-pin jumpers, "Closed" means the jumper is on and "Open" means the jumper is off the pins.



CMOS Clear

JBT1 is used to clear CMOS, which will also clear any passwords. Instead of pins, this jumper consists of contact pads to prevent accidentally clearing the contents of CMOS.

To Clear CMOS

1. First power down the system and unplug the power cord(s). It is also recommended that you remove the onboard battery from the serverboard.
2. With the power disconnected, short the CMOS pads with a metal object such as a small screwdriver.
3. Remove the screwdriver (or shorting device).
4. Reconnect the power cord(s) and power on the system.

Note: Do not use the PW_ON connector to clear CMOS.

LAN Enable/Disable

JPL1 enables or disables the GLAN Port1/GLAN Port2 on the motherboard. See the table on the right for jumper settings. The default setting is Enabled.

LAN Enable/Disable Jumper Settings (JPL1)	
Jumper Setting	Definition
1-2	Enabled (default)
2-3	Disabled

Watch Dog Enable/Disable

Watch Dog (JWD1) is a system monitor that can reboot the system when a software application hangs. Close Pins 1-2 to reset the system if an application hangs. Close Pins 2-3 to generate a non-maskable interrupt signal for the application that hangs. See the table on the right for jumper settings. Watch Dog must also be enabled in the BIOS.

Watch Dog Enable/Disable Jumper Settings (JWD)	
Jumper Setting	Definition
Pins 1-2	Reset
Pins 2-3	NMI
Open	Disabled

VGA Enable/Disable

Jumper JPG1 allows the user to enable the onboard VGA connector. The default setting is 1-2 to enable the connection. See the table on the right for jumper settings.

VGA Enable/Disable Jumper Settings (JPG1)	
Jumper Setting	Definition
Pins 1-2	Enabled
Pins 2-3	Disabled

BMC Enable

Jumper JPB1 allows you to enable the embedded the Renesas BMC (Baseboard Management) Controller to provide IPMI 2.0/KVM support on the motherboard. See the table on the right for jumper settings.

BMC Enable/Disable Jumper Settings (JPB1)	
Jumper Setting	Definition
Pins 1-2	BMC Enable
Pins 2-3	Normal (Default)

I2C Bus to PCI-Exp. Slots

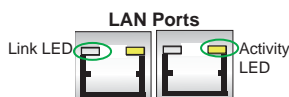
Jumpers JI²C1 and JI²C2 allow you to connect the System Management Bus (I²C) to PCI-Express slots. The default setting is Open to disable the connection. See the table on the right for jumper settings.

I2C to PCI-Exp Jumper Settings	
Jumper Setting	Definition
Closed	Enabled
Open	Disabled (Default)

5-10 Onboard Indicators

LAN1/2 LEDs

The LAN 1/2 ports are located on the IO Backplane. Each Ethernet LAN port has two LEDs. The Yellow LED on the right indicates activity. The Link LED on the left may be green, amber or off to indicate the speed. See the tables at right for more information.



Rear View (when facing the rear side of the chassis)

LAN Activity Indicator (Right) LED Settings

Color	Status	Definition
Off	No Connections	
Yellow	Flashing	Active

LAN Link Speed Indicator (Left) LED Settings

Color	Definition
Off	No Connection or 10 Mbps
Green	100 Mbps
Amber	1 Gbps

IPMI Dedicated LAN LEDs

In addition to LAN 1/LAN 2, an IPMI Dedicated LAN is also located on the I/O Backplane of the motherboard. The amber LED on the right indicates connection and activity, while the green LED on the left indicates the speed of the connection. See the tables at right for more information.



IPMI LAN Link LED (Left) & Activity LED (Right)

Color	Status	Definition
Green: Solid	Link (Left)	100 Mb/s
Amber Blinking	Activity (Right)	Active

Onboard Power LED

An Onboard Power LED is located at LE1 on the motherboard. When this LED is on, the system is on. Be sure to turn off the system and unplug the power cord before removing or installing components. See the tables at right for more information.

Onboard PWR LED Indicator LED Settings (LE1)

LED Color	Definition
Off	System Off (PWR cable not connected)
Green	System On
Green: Flashing Quickly	ACPI S1 State

Rear UID LED

The rear UID LED is located at LED3 on the rear of the motherboard. This LED is used in conjunction with the rear UID switch to provide easy identification of a system that might be in need of service. Refer to UID Switch on Page 2-17 for more information.

UID LED Status	
Color/State	Status
Blue: On	Unit Identified
Blue: On	Unit Identified

BMC Heartbeat LED

A BMC Heartbeat LED is located at DM1 on the motherboard. When DM1 is blinking, BMC functions normally. See the table at right for more information.

BMC Heartbeat LED Status	
Color/State	Definition
Green: Blinking	BMC: Normal

5-11 SATA Drive Connections

SATA/SC8U Ports

There are six Serial ATA ports (I-SATA0~I-SATA 5) located on the motherboard, including four SATA2 ports and two SATA3 ports. There are also four SCU ports (SCU 0~3) located on the X9DRW-iF. These ports provide serial-link signal connections, which are faster than the connections of Parallel ATA. See the table on the right for pin definitions.

SATA/SCU Pin Definitions	
Pin#	Definition
1	Ground
2	TX_P
3	TX_N
4	Ground
5	RX_N
6	RX_P
7	Ground

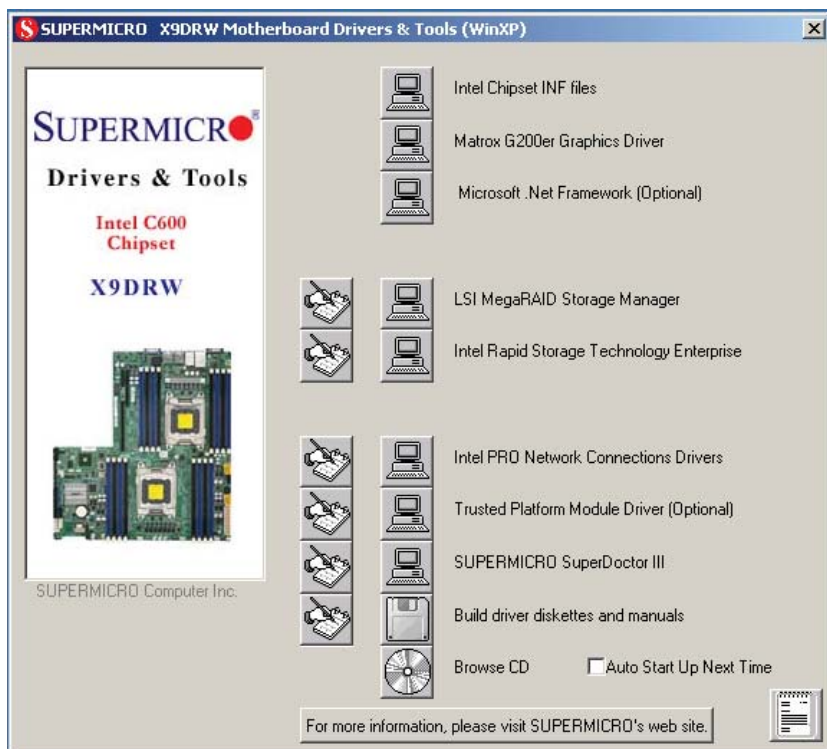
Note: For more information on SATA HostRAID configuration, please refer to the Intel SATA HostRAID User's Guide posted on our Website @ <http://www.supermicro.com>.

5-13 Installing Drivers

The CD that came bundled with the system contains drivers, some of which must be installed, such as the chipset driver. After inserting this CD into your CD-ROM drive, the display shown in Figure 5-5 should appear. (If this display does not appear, click on the My Computer icon and then on the icon representing your CD-ROM drive. Finally, double click on the S "Setup" icon.)

Click the icons showing a hand writing on paper to view the readme files for each item. Click the computer icons to the right of these items to install each item (from top to the bottom) one at a time. After installing each item, you should reboot the system before moving on to the next item on the list. The bottom icon with a CD on it allows you to view the entire contents of the CD.

Figure 5-5. Driver/Tool Installation Display Screen



Supero Doctor III

The SuperDoctor® III program is a Web base management tool that supports remote management capability. It includes Remote and Local Management tools. The local management is called SD III Client. The SuperDoctor III program included on the CD-ROM that came with your motherboard allows you to monitor the environment and operations of your system. SuperDoctor III displays crucial system information such as CPU temperature, system voltages and fan status. See the Figure below for a display of the SuperDoctor III interface.

Note: The default User Name and Password for SuperDoctor III is ADMIN / ADMIN.

Note: When SuperDoctor is first installed, it adopts the temperature threshold settings that have been set in BIOS. Any subsequent changes to these thresholds must be made within SuperDoctor, as the SuperDoctor settings override the BIOS settings. To set the BIOS temperature threshold settings again, you would first need to uninstall SuperDoctor.

Figure 5-6. Supero Doctor III Interface Display Screen (Health Information)

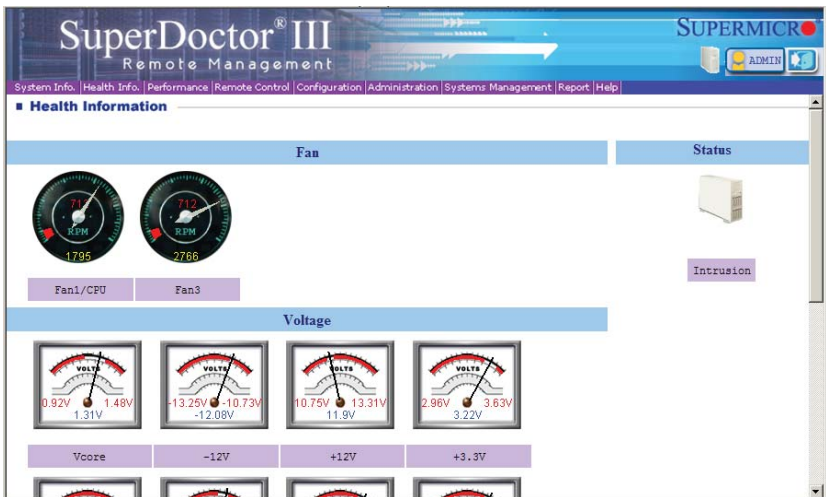
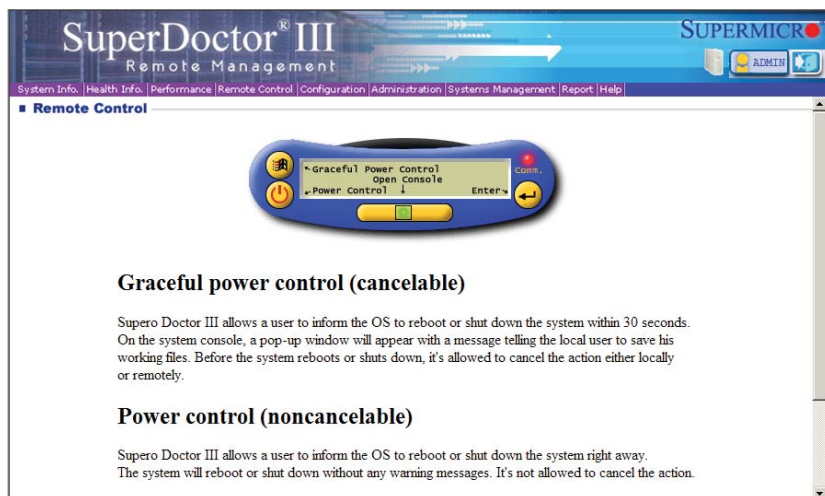


Figure 5-7. Supero Doctor III Interface Display Screen (Remote Control)



Note: The SuperDoctor III program and User's Manual can be downloaded from the Supermicro web site at <http://www.supermicro.com/products/accessories/software/SuperDoctorIII.cfm>. For Linux, we recommend that you use the SuperDoctor II application instead.

Chapter 6

Advanced Chassis Setup

This chapter covers the steps required to install components and perform maintenance on the SC113TQ-R700WB chassis. For component installation, follow the steps in the order given to eliminate the most common problems encountered. If some steps are unnecessary, skip ahead to the next step.

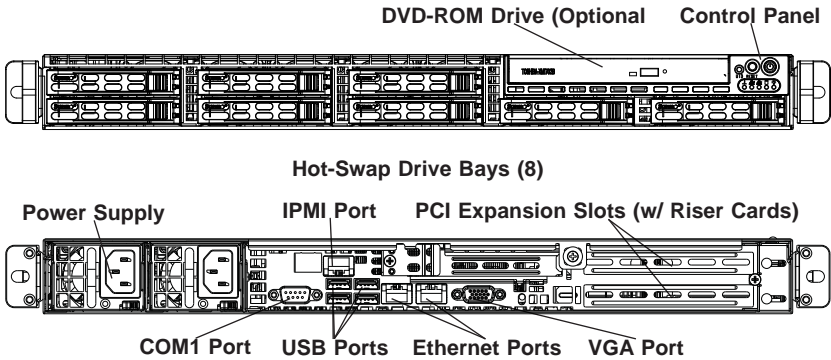
Tools Required: The only tool you will need to install components and perform maintenance is a Philips screwdriver.

6-1 Static-Sensitive Devices

Electrostatic discharge (ESD) can damage electronic components. To prevent damage to any printed circuit boards (PCBs), it is important to handle them very carefully. The following measures are generally sufficient to protect your equipment from ESD damage.

Precautions

- Use a grounded wrist strap designed to prevent static discharge.
- Touch a grounded metal object before removing any board from its antistatic bag.
- Handle a board by its edges only; do not touch its components, peripheral chips, memory modules or gold contacts.
- When handling chips or modules, avoid touching their pins.
- Put the serverboard, add-on cards and peripherals back into their antistatic bags when not in use.
- For grounding purposes, make sure your computer chassis provides excellent conductivity between the power supply, the case, the mounting fasteners and the serverboard.

Figure 6-1. Chassis: Front and Rear Views

6-2 Control Panel

The control panel (located on the front of the chassis) must be connected to the JF1 connector on the serverboard to provide you with system status indications. These wires have been bundled together as a ribbon cable to simplify the connection.

Connect the cable from JF1 on the serverboard to the appropriate header on the Control Panel PCB (printed circuit board). Make sure the red wire plugs into pin 1 on both connectors. Pull all excess cabling out of the airflow path.

The control panel LEDs inform you of system status. See "Chapter 3: System Interface" for details on the LEDs and the control panel buttons. Details on JF1 can be found in "Chapter 5: Advanced Serverboard Setup."

6-3 System Fans

Five 4-cm counter-rotating fans provide the cooling for the system. Each fan unit is actually made up of two fans joined back-to-back, which rotate in opposite directions. This counter-rotating action generates exceptional airflow and works to dampen vibration levels. The SC113 chassis provides two additional open fan housings, where an additional system fan may be added for optimal cooling.

It is very important that the chassis top cover is properly installed and making a good seal in order for the cooling air to circulate properly through the chassis and cool the components. See Figure 6-2 System Fan Failure.

Adding a System Fan

1. Turn off the power to the system and unplug the power cord.
2. Remove the chassis cover then remove the dummy fan from the fan tray.

3. Place the new fan into the vacant space in the housing while making sure the arrows on the top of the fan (indicating air direction) point in the same direction as the arrows on the other fans.
4. Connect the fan wires to the fan header on the serverboard.
5. Power up the system and check that the fan is working properly before replacing the chassis cover.

System Fan Failure

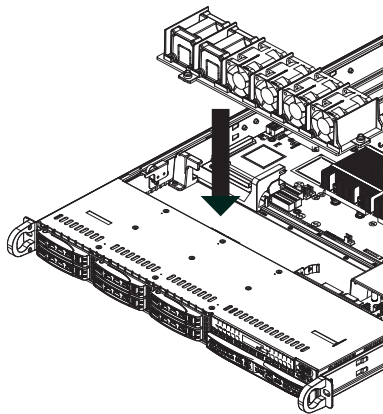
Fan speed is controlled by system temperature via IPMI. If a fan fails, the remaining fans will ramp up to full speed. Replace any failed fan at your earliest convenience with the same type and model (the system can continue to run with a failed fan).

The SC113 chassis includes four pre-installed fans. Two additional open slots are available so that, up to two more fans may be added.

Replacing a System Fan (Figure 6-2)

1. Open the chassis while the system is running to determine which fan has failed. Never run the server for an extended period of time with the chassis open.
2. Turn off the power to the system and unplug the power cord.
3. Remove the failed fan's wiring from the fan header on the serverboard.
4. Lift the failed fan from the chassis and pull it completely out.
5. Place the new fan into the vacant space in the housing while making sure the arrows on the top of the fan (indicating air direction) point in the same direction as the arrows on the other fans.
6. Reconnect the fan wires to the same chassis fan header as the previous fan.
7. Power up the system and check that the fan is working properly and that the LED on the control panel has turned off. Finish by replacing the chassis cover.

Figure 6-2: Replacing a System Fan (shown with optional fan installed)



6-4 Drive Bay Installation/Removal

Accessing the Drive Bays

Hard Drives: Because of their hotswap capability, you do not need to access the inside of the chassis or power down the system to install or replace hard drives. Proceed to the next section for instructions.

DVD-ROM Drive: For installing/removing a DVD-ROM drive, you will need to gain access to the inside of the system by removing the top cover of the chassis. Proceed to the "DVD-ROM Drive Installation" section later in this chapter for instructions.

Note: Only a "slim" DVD-ROM drive will fit into the 1027R-WRF.

Hard Drive Installation

The hard drives are mounted in drive carriers to simplify their installation and removal from the chassis. These carriers also help promote proper airflow for the drive bays. For this reason, even empty carriers without drives installed must remain in the chassis.

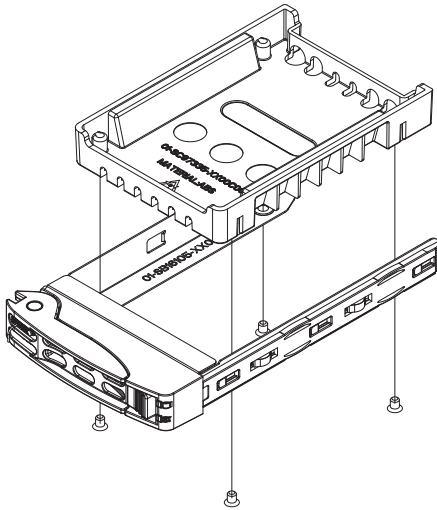
Installing a Hard Drive into a Drive Carrier (Figure 6-3)

1. Insert a drive into the carrier with the PCB side facing down and the connector end toward the rear of the carrier.
2. Align the drive in the carrier so that the screw holes of both line up. Note that there are holes in the carrier marked "SATA" to aid in correct installation.
3. Secure the drive to the carrier with four screws as illustrated below.
4. Insert the drive carrier into its bay, keeping the carrier oriented so that the hard drive is on the top of the carrier and the release button is on the right side. When the carrier reaches the rear of the bay, the release handle will retract.
5. Push the handle in until it clicks into its locked position

Removing a Hard Drive (Figure 6-4)

1. To remove a carrier, push the release button located beside the drive LEDs.

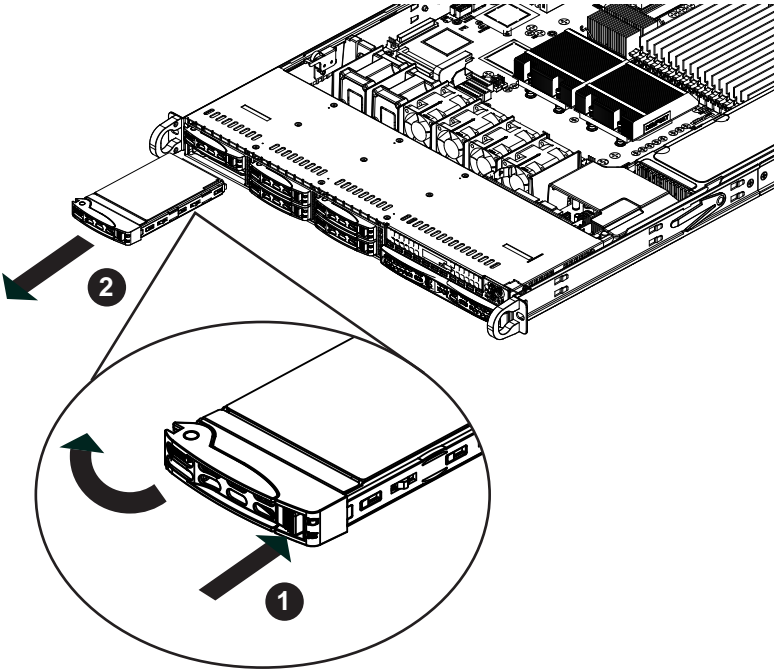
Figure 6-3: Installing a Hard Drive into a Carrier



2. Swing the handle fully out and use it to pull the unit straight out.

Note: Your operating system must have RAID support to enable the hot-plug capability of the hard drives.

Figure 6-4. Removing a Hard Drive



Caution: Use caution when working around the hard drive backplane. Do not touch the backplane with any metal objects and make sure no ribbon cables touch the backplane or obstruct the holes, which aid in proper airflow.

Caution: Regardless of how many hard drives are installed, all drive carriers must remain in the drive bays to maintain proper airflow.

Caution! Enterprise level hard disk drives are recommended for use in Supermicro chassis and servers. For information on recommended HDDs, visit the Supermicro Web site at <http://www.supermicro.com/products/nfo/files/storage/SAS-Complst.pdf>

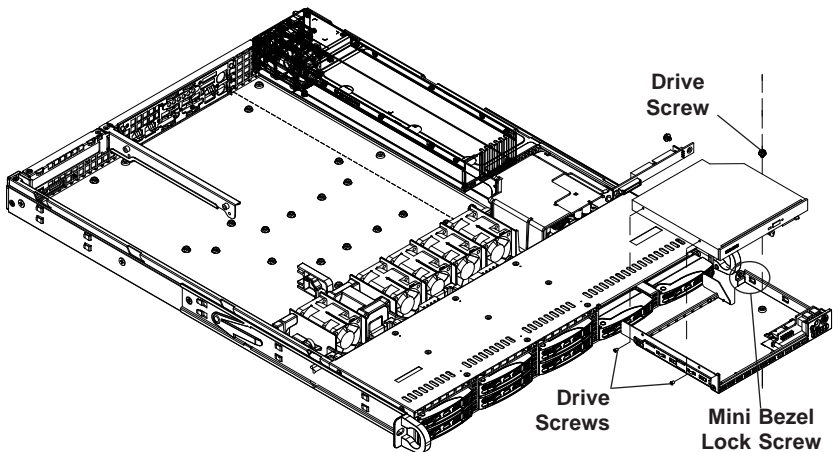
DVD Drive Installation

The SC113 chassis can install an optional DVD-ROM.

Installing or Replacing a DVD-ROM Drive (Figure 6-5)

1. Power down the system and if necessary, remove the server from the rack and the front bezel from the chassis.
2. Remove the chassis cover.
3. Unplug the drives power and data cables from the serverboard and/or backplane.
4. If you are adding a new drive: Remove the mini-bezel (grate) from the drive bay. The bezel can be removed by pulling out the hard drive beneath the DVD-ROM, then pulling the mini-bezel forward.
If you are replacing a drive: Locate the locking tab at the rear (left hand side when viewed from the front) of the DVD-ROM drive. Push the tab toward the drive and push the drive unit out the front of the chassis.
5. Insert the new drive unit in the slot until the tab locks in place.
6. Reconnect the data and power cables.
7. Replace the chassis cover (replace the server in the rack, if necessary) and power up the system.

Figure 6-5. Installing the DVD-ROM Drive



6-5 Power Supply

The SUPERSERVER 1027R-WRF has two 700 Watt power supplies, which are auto-switching capable. This enables it to automatically sense and operate with a 100V to 240V input voltage.

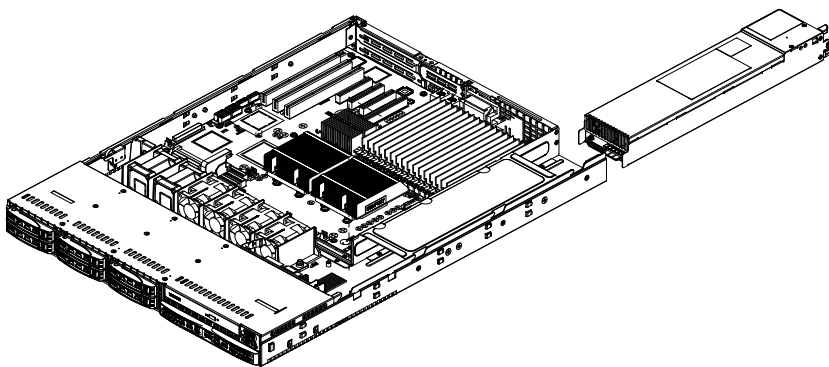
Power Supply Failure

If the power supply module fails, the Universal Information LED on the control panel will blink slowly and remain so until the failed module has been replaced. Replacement modules can be ordered directly from Supermicro (see contact information in the Preface).

Removing/Replacing the Power Supply (Figure 6-6)

1. Check the LEDs on the power supplies to determine which module has failed.
2. Push the release tab (on the back of the power supply) as illustrated.
3. Pull the power supply out using the handle provided.
4. Replace the failed power module with the same model.
5. Push the new power supply module into the power bay until you hear a click.

Figure 6-6. Removing/Replacing the Power Supply



Chapter 7

BIOS

7-1 Introduction

This chapter describes the AMI BIOS Setup Utility for the SUPERSERVER 1027R-WRF. The AMI ROM BIOS is stored in a Flash EEPROM and can be easily updated. This chapter describes the basic navigation of the AMI BIOS Setup Utility setup screens.

Starting the Setup Utility

To enter the BIOS Setup Utility, hit the <Delete> key while the system is booting-up. (In most cases, the <Delete> key is used to invoke the BIOS setup screen. There are a few cases when other keys are used, such as <F1>, <F2>, etc.) Each main BIOS menu option is described in this manual.

The Main BIOS screen has two main frames. The left frame displays all the options that can be configured. "Grayed-out" options cannot be configured. The right frame displays the key legend. Above the key legend is an area reserved for a text message. When an option is selected in the left frame, it is highlighted in white. Often a text message will accompany it. (Note that BIOS has default text messages built in. We retain the option to include, omit, or change any of these text messages.) Settings printed in **Bold** are the default values.

A " ► " indicates a submenu. Highlighting such an item and pressing the <Enter> key will open the list of settings within that submenu.

The BIOS setup utility uses a key-based navigation system called hot keys. Most of these hot keys (<F1>, <F10>, <Enter>, <ESC>, <Arrow> keys, etc.) can be used at any time during the setup navigation process.

7-2 Main Menu

When you first enter AMI BIOS Setup Utility, you will see the Main Menu screen. You can always return to the Main Menu by selecting the Main tab on the top of the screen with the arrow keys.

The Main Menu screen provides you with a system overview, which includes the version, built date and ID of the AMIBIOS, the type, speed and number of the processors in the system and the amount of memory installed in the system.

System Time/System Date

You can edit this field to change the system time and date. Highlight *System Time* or *System Date* using the <Arrow> keys. Enter new values through the keyboard. Press the <Tab> key or the <Arrow> keys to move between fields. The date must be entered in DAY/MM/DD/YYYY format. The time is entered in HH:MM:SS format. Please note that time is in a 24-hour format. For example, 5:30 A.M. appears as 05:30:00 and 5:30 P.M. as 17:30:00.

7-3 Advanced Settings Menu

Use the arrow keys to select Advanced Setup and press <Enter> to access the following submenu items.

► Boot Features

Quiet Boot

This feature allows the user to select bootup screen display between POST messages and the OEM logo. Select Disabled to display the POST messages. Select Enabled to display the OEM logo instead of the normal POST messages. The options are **Enabled** and Disabled.

AddOn ROM Display Mode

Use this item to set the display mode for the Option ROM. Select Keep Current to use the current AddOn ROM Display setting. Select Force BIOS to use the Option ROM display mode set by the system BIOS. The options are **Force BIOS** and Keep Current.

Bootup Num-Lock

Use this feature to set the Power-on state for the Numlock key. The options are Off and **On**.

Wait For 'F1' If Error

Select Enabled to force the system to wait until the 'F1' key is pressed if an error occurs. The options are Disabled and **Enabled**.

Interrupt 19 Capture

Interrupt 19 is the software interrupt that handles the boot disk function. When this item is set to Enabled, the ROM BIOS of the host adaptors will "capture" Interrupt 19 at bootup and allow the drives that are attached to these host adaptors to function as bootable disks. If this item is set to Disabled, the ROM BIOS of the host adaptors will not capture Interrupt 19, and the drives attached to these adaptors will not function as bootable devices. The options are **Enabled** and Disabled.

Power Configuration

Watch Dog Function

If enabled, the Watch Dog timer will allow the system to reboot when it is inactive for more than 5 minutes. The options are Enabled and **Disabled**.

Power Button Function

If this feature is set to Instant Off, the system will power off immediately as soon as the user presses the power button. If this feature is set to 4 Seconds Override, the system will power off when the user presses the power button for 4 seconds or longer. The options are **Instant Off** and 4 Seconds Override.

Restore on AC Power Loss

Use this feature to set the power state after a power outage. Select Stay Off for the system power to remain off after a power loss. Select Power-On for the system power to be turned on after a power loss. Select Last State to allow the system to resume its last state before a power loss. The options are Stay Off, Power On, and **Last State**.

CPU Configuration

This submenu displays the information of the CPU as detected by the BIOS. It also allows the user to configure the CPU settings.

►Socket 1 CPU Information/Socket 2 CPU Information

This submenu displays the following information regarding the CPUs installed in Socket 1/ Socket 2.

- Type of CPU
- CPU Signature
- Microcode Patch
- CPU Stepping
- Maximum CPU Speed
- Minimum CPU Speed
- Processor Cores
- Intel HT (Hyper-Threading) Technology
- Intel VT-x Technology
- Intel SMX Technology
- L1 Data Cache
- L1 Code Cache
- L2 Cache
- L3 Cache

CPU Speed

This item displays the speed of the CPU installed in Socket 1/Socket 2.

64-bit

This item indicates if the CPU installed in Socket 1 or Socket 2 supports 64-bit technology.

Clock Spread Spectrum

Select Enable to enable Clock Spectrum support, which will allow the BIOS to monitor and attempt to reduce the level of Electromagnetic Interference caused by the components whenever needed. The options are **Disabled** and Enabled.

Hyper-threading

Select Enabled to support Intel Hyper-threading Technology to enhance CPU performance. The options are **Enabled** and Disabled.

Active Processor Cores

Set to Enabled to use a processor's second core and above. (Please refer to Intel's website for more information.) The options are **All**, 1, 2, and 4.

Limit CPUID Maximum

This feature allows the user to set the maximum CPU ID value. Enable this function to boot the legacy operating systems that cannot support processors with extended CPUID functions. The options are **Disabled** (for the Windows OS), and **Enabled**.

Execute Disable Bit Capability (Available if supported by the OS & the CPU)

Select **Enabled** to enable the Execute Disable Bit which will allow the processor to designate areas in the system memory where an application code can execute and where it cannot, thus preventing a worm or a virus from flooding illegal codes to overwhelm the processor or damage the system during an attack. The options are **Enabled** and **Disabled**. (Refer to Intel and Microsoft Web sites for more information.)

Intel® AES-NI

Select **Enable** to use the Intel Advanced Encryption Standard (AES) New Instructions (NI) to ensure data security. The options are **Enabled** and **Disabled**.

Hardware Prefetcher (Available when supported by the CPU)

If set to **Enabled**, the hardware prefetcher will prefetch streams of data and instructions from the main memory to the L2 cache to improve CPU performance. The options are **Disabled** and **Enabled**.

Adjacent Cache Line Prefetch (Available when supported by the CPU)

The CPU prefetches the cache line for 64 bytes if this feature is set to **Disabled**. The CPU prefetches both cache lines for 128 bytes as comprised if this feature is set to **Enabled**.

DCU Streamer Prefetcher (Available when supported by the CPU)

Select **Enabled** to support Data Cache Unite (DCU) prefetch to speed up data accessing and processing in the DCU to enhance CPU performance. The options are **Disabled** and **Enabled**.

DCU IP Prefetcher

Select **Enabled** for DCU (Data Cache Unit) IP Prefetcher support, which will prefetch IP addresses to improve network connectivity and system performance. The options are **Enabled** and **Disabled**.

Intel® Virtualization Technology (Available when supported by the CPU)

Select **Enabled** to support Intel Virtualization Technology, which will allow one platform to run multiple operating systems and applications in independent partitions, creating multiple "virtual" systems in one physical computer. The options are **Enabled** and **Disabled**.

Note: If there is any change to this setting, you will need to power off and restart the system for the change to take effect. Please refer to Intel's website for detailed information.)

► CPU Power Management Configuration

This submenu allows the user to configure the following CPU Power Management settings.

Power Technology

Select **Energy Efficient** to support power-saving mode. Select **Custom** to customize system power settings. Select **Disabled** to disable power-saving settings. The options are **Disabled**, **Energy Efficient**, and **Custom**. If the option is set to **Custom**, the following items will display:

EIST (Available when Power Technology is set to Custom)

EIST (Enhanced Intel SpeedStep Technology) allows the system to automatically adjust processor voltage and core frequency to reduce power consumption and heat dissipation. The options are **Disabled (GV3 Disabled)**, and **Enabled (GV3 Enabled)**. (**Note:** GV3 is Intel Speedstep support used on older platforms.) Please refer to Intel's website for detailed information.)

Turbo Mode (Available when Power Technology is set to Custom)

Select **Enabled** to use the Turbo Mode to boost system performance. The options are **Enabled** and **Disabled**.

C1E (Available when Power Technology is set to Custom)

Select **Enabled** to enable Enhanced C1 Power State to maximize energy efficiency. The options are **Enabled** and **Disabled**.

CPU C3 Report (Available when Power Technology is set to Custom)

Select **Enabled** to allow the BIOS to report the CPU C3 State (ACPI C2) to the operating system. During the CPU C3 State, the CPU clock generator is turned off. The options are **Enabled** and **Disabled**.

CPU C6 Report (Available when Power Technology is set to Custom)

Select **Enabled** to allow the BIOS to report the CPU C6 State (ACPI C3) to the operating system. During the CPU C6 State, the power to all cache is turned off. The options are **Enabled** and **Disabled**.

CPU C7 Report (Available when Power Technology is set to Custom)

Select Enabled to allow the BIOS to report the CPU C7 State (ACPI C3) to the operating system. CPU C7 State is a processor-specific low C-State. The options are **Enabled** and Disabled.

Package C-State limit (Available when Power Technology is set to Custom)

This feature allows the user to set the limit on the C-State package register. The options are C0, C2, **C6**, and No Limit.

Factory Long Duration Power Limit

This item displays the power limit set by the manufacturer during which long duration power is maintained.

Long Duration Power Limit

This item displays the user-defined power limit (in watts) during which long duration power is maintained.

Factory Long Duration Maintained (Available when Power Technology is set to Custom)

This item displays the period of time set by the manufacturer during which long duration power is maintained.

Long Duration Maintained

This item displays the period of time in seconds during which long duration power is maintained.

Recommended Short Duration Power

This item displays the short duration power settings recommended by the manufacturer.

Short Duration Power Limit

This item displays the time period during which short duration power is maintained.

► Chipset Configuration

► North Bridge

This feature allows the user to configure the settings for the Intel North Bridge.

► Integrated IO Configuration

Intel VT-d

Select Enabled to enable Intel Virtualization Technology support for Direct I/O VT-d by reporting the I/O device assignments to the VWM (Virtual Working Memory) through the DMAR ACPI Tables. This feature offers fully-protected I/O resource sharing across Intel platforms, providing greater reliability, security and availability in networking and data-sharing. The options are Disabled and **Enabled**.

Intel I/OAT

The Intel I/OAT (I/O Acceleration Technology) significantly reduces CPU overhead by leveraging CPU architectural improvements, freeing the system resource for other tasks. The options are Disabled and **Enabled**.

DCA Support

Select Enabled to use Intel's DCA (Direct Cache Access) Technology to improve data transfer efficiency. The options are Disabled and **Enabled**.

I/O 1 PCIe Port Bifurcation Control/ I/O 2 PCIe Port Bifurcation Control

This submenu configures the following IO PCIe Port Bifurcation Control settings for I/O 1 PCIe ports or I/O 2 PCIe ports to determine how the available PCI-Express lanes are distributed between the PCI-Express Root Ports.

I/O 2 PCIe Port

This item configures IOU2-PCIe Port settings. The options are: x4x4x4x4, x4x4x8, x8x4x4, x8x8, x16 and **Auto**.

I/O 3 PCIe Port

This item configures IOU3-PCIe Port settings. The options are: x4x4x4x4, x4x4x8, x8x4x4, x8x8, x16 and **Auto**.

►QPI Configuration

Current QPI Link

This item displays the current status of the QPI Link.

Current QPI Frequency

This item displays the frequency of the QPI Link.

Isoc

Select **Enabled** to enable Isochronous support to meet QoS (Quality of Service) requirements. This feature is especially important for virtualization technology. The options are **Enabled** and **Disabled**.

QPI (Quick Path Interconnect) Link Speed Mode

Use this feature to select data transfer speed for QPI Link connections. The options are **Fast** and **Slow**.

QPI Link Frequency Select

Use this feature to select the desired QPI frequency. The options are **Auto**, 6.4 GT/s, 7.2 GT/s, and 8.0 GT/s.

►DIMM Configuration

This section displays the following DIMM information.

Current Memory Mode

This item displays the current memory mode.

Current Memory Speed

This item displays the current memory speed.

Mirroring

This item displays if memory mirroring is supported by the motherboard. Memory mirroring creates a duplicate copy of the data stored in the memory to enhance data security.

Sparing

This item displays if memory sparing is supported by the motherboard. Memory sparing enhances system performance.

►DIMM Information

The status of the memory modules specified below will be displayed as detected by the BIOS.

CPU Socket 1 DIMM Information

P1-DIMMA1/P1-DIMMB1/P1-DIMMC1/P1-DIMMD1/P1-DIMMA2/P1-DIMMB2/
P1-DIMMC2/P1-DIMMD2

CPU Socket 2 DIMM Information

P2-DIMME1/P2-DIMMF1/P2-DIMMG1/P2-DIMMH1/P2-DIMME2/P2-DIMMF2/
P2-DIMMG2/P2-DIMMH2

Memory Mode

When Independent is selected, all DIMMs are available to the operating system. When Mirroring is selected, the motherboard maintains two identical copies of all data in memory for data backup. When Lockstep is selected, the motherboard uses two areas of memory to run the same set of operations in parallel. The options are **Independent**, Mirroring, and Lockstep.

DRAM RAPL Mode

RAPL (Running Average Power Limit) provides mechanisms to enforce power consumption limits on supported processors. The options are Disabled, DRAM RAPL MODE0, and **DRAM RAPL MODE1**.

DDR Speed

Use this feature to force a DDR3 memory module to run at a frequency other than what is specified in the specification. The options are **Auto**, Force DDR3-800, Force DDR3-1066, Force DDR3-1333, Force DDR3-1600 and Force SPD.

Channel Interleaving

This feature selects from the different channel interleaving methods. The options are **Auto**, 1 Way, 2 Way, 3, Way, and 4 Way.

Rank Interleaving

This feature allows the user to select a rank memory interleaving method. The options are **Auto**, 1 Way, 2 Way, 4, Way, and 8 Way.

Patrol Scrub

Patrol Scrubbing is a process that allows the CPU to correct correctable memory errors detected on a memory module and send the correction to the requestor (the original source). When this item is set to Enabled, the IO hub will read and write back one cache line every 16K cycles, if there is no delay caused by internal processing. By using this method, roughly 64 GB of memory behind the IO hub will be scrubbed every day. The options are **Enabled** and Disabled.

Demand Scrub

Demand Scrubbing is a process that allows the CPU to correct correctable memory errors found on a memory module. When the CPU or I/O issues a demand-read command, and the read data from memory turns out to be a correctable error, the error is corrected and sent to the requestor (the original source). Memory is updated as well. Select Enabled to use Demand Scrubbing for ECC memory correction. The options are Enabled and **Disabled**.

Data Scrambling

Select Enabled to enable data scrubbing to ensure data security and integrity. The options are **Disabled** and Enabled.

Device Tagging

Select Enabled to support device tagging. The options are **Disabled** and Enabled.

Thermal Throttling

Throttling improves reliability and reduces power consumption in the processor via automatic voltage control during processor idle states. The options are Disabled and **CLTT** (Closed Loop Thermal Throttling).

► South Bridge Configuration

This feature allows the user to configure the settings for the Intel PCH chip.

PCH Information

This feature displays the following PCH information.

Name:

This item displays the name of the PCH chip.

Stepping:

This item displays the status of PCH stepping.

USB Devices:

This item displays the USB devices detected by the BIOS.

All USB Devices

This feature enables all USB ports/devices. The options are Disabled and **Enabled**. (If set to Enabled, EHCI Controller 1 and Controller 2 will appear.)

EHCI Controller 1/EHCI Controller 2 (Available when All USB Devices are set to Enabled)

Select Enabled to enable EHCI (Enhanced Host Controller Interface) Controller 1 or Controller 2. The options are Disabled and **Enabled**.

Legacy USB Support (Available when USB Functions is not Disabled)

Select Enabled to support legacy USB devices. Select Auto to disable legacy support if USB devices are not present. Select Disable to have USB devices available for EFI (Extensive Firmware Interface) applications only. The settings are Disabled, **Enabled** and Auto.

Port 60/64 Emulation

Select Enabled to enable I/O port 60h/64h emulation support for the legacy USB keyboard so that it can be fully supported by the operating systems that does not recognize a USB device. The options are Disabled and **Enabled**.

EHCI Hand-Off

This item is for operating systems that do not support Enhanced Host Controller Interface (EHCI) hand-off. When enabled, EHCI ownership change will be claimed by the EHCI driver. The options are **Disabled** and Enabled.

► SATA Configuration

When this submenu is selected, the AMI BIOS automatically detects the presence of IDE or SATA devices and displays the following items.

SATA Port0~SATA Port5:

The AMI BIOS displays the status of each SATA port as detected by the BIOS.

SATA Mode

Use this feature to configure SATA mode for a selected SATA port. The options are Disabled, IDE Mode, **AHCI Mode** and RAID Mode. The following are displayed depending on your selection:

IDE Mode

The following items are displayed when IDE Mode is selected:

SATA (Serial-ATA) Controller 0/SATA (Serial-ATA) Controller 1

Use this feature to activate/deactivate and to set the SATA mode for SATA Controller 0 or SATA Controller 1. The options for Controller 0 are Disabled, Enhanced and **Compatible**. The Options for Controller 1 are Disabled and **Enhanced**.

AHCI Mode

The following items are displayed when the AHCI Mode is selected.

Aggressive Link Power Management

Select Enabled to enable Aggressive Link Power Management support for Cougar Point B0 stepping and beyond. The options are **Enabled** and Disabled.

Port 0~5 Hot Plug

Select Enabled to enable hot-plug support for a particular port, which will allow the user to change a hardware component or device without shutting down the system. The options are Enabled and **Disabled**.

Staggered Spin Up

Select Enabled to enable Staggered Spin-up support to prevent excessive power consumption caused by multiple HDDs spinning-up simultaneously. The options are Enabled and **Disabled**.

RAID Mode

The following items are displayed when RAID Mode is selected:

Port 0~5 Hot Plug

Select Enabled to enable hot-plug support for the particular port. The options are **Enabled** and Disabled.

►SCU (Storage Control Unit) Configuration

Storage Controller Unit

Select Enabled to enable PCH SCU storage devices. The options are Disabled and **Enabled**.

OnChip SCU Option ROM

Select Enabled to support the onboard SCU Option ROM to boot up the system via a storage device. The options are Disabled and **Enabled**.

SCU Port 0~CU Port 7: The AMI BIOS will automatically detect the onboard SCU devices and display the status of each SCU device as detected.

►PCIe/PCI/PnP Configuration

PCI ROM Priority

Use this feature to select the Option ROM to boot the system when there are multiple Option ROMs available in the system. The options are EFI Compatible ROM and **Legacy ROM**.

PCI Latency Timer

Use this feature to set the latency Timer of each PCI device installed on a PCI bus. Select 64 to set the PCI latency to 64 PCI clock cycles. The options are 32, **64**, 96, 128, 160, 192, 224 and 248.

Above 4G Decoding (Available if the system supports 64-bit PCI decoding)

Select Enabled to decode a PCI device that supports 64-bit in the space above 4G Address. The options are Enabled and **Disabled**.

PERR# Generation

Select Enabled to allow a PCI device to generate a PERR number for a PCI Bus Signal Error Event. The options are Enabled and **Disabled**.

SERR# Generation

Select Enabled to allow a PCI device to generate an SERR number for a PCI Bus Signal Error Event. The options are **Enabled** and Disabled.

Maximum Payload

Select Auto to allow the system BIOS to automatically set the maximum payload value for a PCI-E device to enhance system performance. The options are **Auto**, 128 Bytes, 256 Bytes, 512 Bytes, 1024 Bytes, 2048 Bytes, and 4096 Bytes.

Maximum Read Request

Select Auto to allow the system BIOS to automatically set the maximum Read Request size for a PCI-E device to enhance system performance. The options are **Auto**, 128 Bytes, 256 Bytes, 512 Bytes, 1024 Bytes, 2048 Bytes, and 4096 Bytes.

ASPM Support

This feature allows the user to set the Active State Power Management (ASPM) level for a PCI-E device. Select Force L0 to force all PCI-E links to operate at L0 state. Select Auto to allow the system BIOS to automatically set the ASPM level for the system. Select Disabled to disable ASPM support. The options are **Disabled**, Force L0, and Auto.

Warning: Enabling ASPM support may cause some PCI-E devices to fail!

CPU1 SXB 1A OPROM/CPU1 SXB 1B OPROM/CPU1 SXB 1C OPROM/CPU2 SXB2 PCI-E 3.0 x16 OPROM

Select Enabled to enable Option ROM support to boot the computer using a network interface from the slots specified above. The options are **Enabled** and Disabled.

Onboard LAN Option ROM Select

Select iSCSI to use the iSCSI Option ROM to boot the computer using a network device. Select PXE (Preboot Execution Environment) to use an PXE Option ROM to boot the computer using a network device. The options are iSCSI and **PXE**.

Load Onboard LAN1 Option ROM/Load Onboard LAN2 Option ROM

Select Enabled to enable the onboard LAN1 Option ROM/LAN2 Option ROM. This is to boot the computer using a network device. The default setting for LAN1 Option ROM is **Enabled**, and the default setting for LAN2 Option ROM is **Disabled**.

VGA Priority

This feature allows the user to select the graphics adapter to be used as the primary boot device. The options are **Onboard**, and Offboard.

Network Stack

Select Enabled enable PXE (Preboot Execution Environment) or UEFI (Unified Extensible Firmware Interface) for network stack support. The options are Enabled and **Disabled**.

► Super IO Configuration

Super IO Chip: This item displays the Super IO chip used in the motherboard.

► Serial Port 1 Configuration

Serial Port

Select Enabled to enable a serial port specified by the user. The options are **Enabled** and Disabled.

Device Settings

This feature indicates whether or not a reset is required for a serial port specified.

Change Settings

This option specifies the base I/O port address and the Interrupt Request address of Serial Port 1 and Serial Port 2. The options for Serial Port 1 are: **Auto**, IO=3F8h; IRQ=4; IO=3F8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12; IO=2F8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12; IO=3E8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12; and IO=2E8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12.

► Serial Port 2 Configuration

Serial Port

Select Enabled to enable a serial port specified by the user. The options are **Enabled** and Disabled.

Device Settings

This item displays the settings of Serial Port 2.

Change Settings

This option specifies the base I/O port address and the Interrupt Request address of Serial Port 1 and Serial Port 2. The options for Serial Port 2 are: **Auto**, IO=2F8h; IRQ=3; IO=3F8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12; IO=2F8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12; IO=3E8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12; and IO=2E8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12.

Serial Port 2 Attribute

Use this feature to select the attribute for serial port 2. The options are **SOL** (Serial On LAN), and COM.

► Serial Port Console Redirection

- **COM 1 and SOL/COM 2**

These two submenus allow the user to configure the following Console Redirection settings for a COM Port selected by the user.

Console Redirection

Select Enabled to use a COM Port selected by the user for Console Redirection. The options are Enabled and Disabled. The default setting for COM1 is **Disabled**, and for COM2 is **Enabled**.

► Console Redirection Settings

This feature allows the user to specify how the host computer will exchange data with the client computer, which is the remote computer used by the user.

Terminal Type

This feature allows the user to select the target terminal emulation type for Console Redirection. Select VT100 to use the ASCII Character set. Select VT100+ to add color and function key support. Select ANSI to use the Extended ASCII Character Set. Select VT-UTF8 to use UTF8 encoding to map Unicode characters into one or more bytes. The options are ANSI, VT100, **VT100+**, and VT-UTF8.

Bits Per second

Use this feature to set the transmission speed for a serial port used in Console Redirection. Make sure that the same speed is used in the host computer and the client computer. A lower transmission speed may be required for long and busy lines. The options are 9600, 19200, 57600 and **115200** (bits per second).

Data Bits

Use this feature to set the data transmission size for Console Redirection. The options are 7 Bits and **8 Bits**.

Parity

A parity bit can be sent along with regular data bits to detect data transmission errors. Select Even if the parity bit is set to 0, and the number of 1's in data bits is even. Select Odd if the parity bit is set to 0, and the number of 1's in data bits is odd. Select None if you do not want to send a parity bit with your data bits in transmission. Select Mark to add a mark as a parity bit to be sent along with the data bits. Select Space to add a Space as a parity bit to be sent with your data bits. The options are **None**, Even, Odd, Mark and Space.

Stop Bits

A stop bit indicates the end of a serial data packet. Select 1 Stop Bit for standard serial data communication. Select 2 Stop Bits if slower devices are used. The options are **1** and **2**.

Flow Control

This feature allows the user to set the flow control for Console Redirection to prevent data loss caused by buffer overflow. Send a "Stop" signal to stop sending data when the receiving buffer is full. Send a "Start" signal to start sending data when the receiving buffer is empty. The options are **None** and Hardware RTS/CTS.

VT-UTF8 Combo Key Support

Select Enabled to enable VT-UTF8 Combination Key support for ANSI/VT100 terminals. The options are **Enabled** and Disabled.

Recorder Mode

Select Enabled to capture the data displayed on a terminal and send it as text messages to a remote server. The options are **Disabled** and Enabled.

Resolution 100x31

Select Enabled for extended-terminal resolution support. The options are Disabled and **Enabled**.

Legacy OS Redirection

Use this feature to select the number of rows and columns used in Console Redirection for legacy OS support. The options are 80x24 and **80x25**.

Putty KeyPad

This feature selects Function Keys and KeyPad settings for Putty, which is a terminal emulator designed for the Windows OS. The options are **VT100**, Linux, XTERMR6, SC0, ESCN, and VT400.

► Serial Port for Out-of-Band Management/Windows Emergency Management Services (EMS)

The submenu allows the user to configure Console Redirection settings to support Out-of-Band Serial Port management. The options are **Enabled** and Disabled.

Console Redirection Settings

The feature allows the user to configure console redirection settings for a local machine to communicate with a remote server.

►ACPI Setting

Use this feature to configure Advanced Configuration and Power Interface (ACPI) power management settings for your system.

ACPI Sleep State

Use this feature to select the ACPI State when the system is in sleep mode. Select S1 (CPU_Stop_Clock) to erase all CPU caches and stop executing instructions. Power to the CPU(s) and RAM is maintained, but RAM is refreshed. Select Suspend to use power-reduced mode. Power will only be supplied to limited components (such as RAMs) to maintain the most critical functions of the system. The options are **S1 (CPU_Stop_Clock)**, Suspend and Disabled.

High Precision Event Timer

Select Enabled to activate the High Precision Event Timer (HPET) that produces periodic interrupts at a much higher frequency than a Real-time Clock (RTC) does in synchronizing multimedia streams, providing smooth playback, reducing the dependency on other timestamp calculation devices, such as an x86 RDTSC Instruction embedded in the CPU. The High Performance Event Timer is used to replace the 8254 Programmable Interval Timer. The options are **Enabled** and Disabled.

►Trusted Computing (Available when a TPM device is detected by the BIOS)

Configuration

TPM Support

Select Enabled on this item and enable the TPM jumper on the motherboard to enable TPM support to improve data integrity and network security. The options are **Enabled** and Disabled.

TPM State

Select Enabled to enable TPM security settings to improve data integrity and network security. The options are **Disabled** and Enabled.

Pending Operation: This item displays the status of a pending operation.

Current Status Information: This item displays the information regarding the current TPM status.

TPM Enable Status

This item displays the status of TPM Support to indicate if TPM is currently enabled or disabled.

TPM Active Status

This item displays the status of TPM Support to indicate if TPM is currently active or deactivated.

TPM Owner Status

This item displays the status of TPM Ownership.

►Intel TXT (LT-SX) Configuration

Intel TXT (LT-SX) Hardware Support

This feature indicates if the following hardware components support the Intel Trusted Execution Technology.

CPU: TXT (Trusted Execution Technology) Feature

Chipset: TXT (Trusted Execution Technology) Feature

Intel TXT (LT-SX) Configuration

This feature displays the following TXT configuration setting.

TXT (LT-SX) Support: This item indicated if the Intel TXT support is enabled or disabled.

Intel TXT (LT-SX) Dependencies

This feature displays the features that need to be enabled for the Intel Trusted Execution Technology to work properly in the system.

VT-d Support: Intel Virtualization Technology with Direct I/O support

VT Support: Intel Virtualization Technology support

TPM Support: Trusted Platform support

TPM State: Trusted Platform state

► Intel ME Subsystem Configuration

This feature displays the following ME Subsystem Configuration settings.

- **ME BIOS Interface Version**
- **ME Version**

iSCSI Configuration: This item displays iSCSI configuration information:

iSCSI Initiation Name: This item displays the name of the iSCSI Initiator, which is a unique name used in the world.

► Add an Attempt

► Delete Attempts

► Commit Changes and Exit

Save the changes and exit from the page.

► Discard Changes and Exit

Discard the changes and exit from the page.

► Change Attempt Order

► Commit Changes and Exit

Save the changes and exit from the page.

► Discard Changes and Exit

Discard the changes and exit from the page.

Intel® I350 Gigabit Network Connections: These items display the following information on the Intel I350 LAN connections.

Port Configuration Menu

►NIC Configuration

Link Speed

This item allows the user to set the link speed for your network connections. The Options are **AutoNeg (Auto Negotiation)**, 10 Mbps Half, 10 Mbps Full, 100 Mbps Half, and 10 Mbps Full.

Wake On LAN (WOL)

Select Enabled to wake up the system with a device (a magic packet). The options are Disabled and **Enabled**.

Blink LEDs (Range 0~15 seconds)

This item sets the duration of blinking for NIC LEDs. The range of duration is from 0 second to 15 seconds. The default setting is **0** second.

Port Configuration Information

This menu displays the following information for a NIC port specified.

- UEFI Driver
- Adapter PBA
- Chip Type
- PCI Device ID
- PCI Bus: Device: Function:
- Link Status: This item displays the link status of network connections.
- Factory MAC Address
- Alternate MAC Address

7-3 Event Logs

Use this feature to configure Event Log settings.

►Change SMBIOS Event Log Settings

This feature allows the user to configure SMBIOS Event settings.

Enabling/Disabling Options

SMBIOS Event Log

Select Enabled to enable SMBIOS (System Management BIOS) Event Logging during system boot. The options are **Enabled** and Disabled.

Runtime Error Logging Support

Select Enabled to support Runtime Error Logging. The options are **Enabled** and **Disabled**.

Memory Correctable Error Threshold

This feature allows the user to enter the threshold value for correctable memory errors. The default setting is **10**.

PCI Error Logging Support

Select Enabled to support error event logging for PCI slots. The options are Enabled and **Disabled**.

Erasing Settings

Erase Event Log

Select Enabled to erase the SMBIOS (System Management BIOS) Event Log, which is completed before a event logging is initialized upon system reboot. The options are **No**; Yes, next Reset; and Yes, every reset.

When Log is Full

Select Erase Immediately to immediately erase SMBIOS error event logs that exceed the limit when the SMBIOS event log is full. Select Do Nothing for the system to do nothing when the SMBIOS event log is full. The options are **Do Nothing** and Erase Immediately.

SMBIOS Event Log Standard Settings

Log System Boot Event

Select Enabled to log system boot events. The options are **Disabled** and Enabled.

MECI (Multiple Event Count Increment)

Enter the increment value for the multiple event counter. Enter a number between 1 to 255. The default setting is **1**.

METW (Multiple Event Count Time Window)

This item allows the user to decide how long (in minutes) should the multiple event counter wait before generating a new event log. Enter a number between 0 to 99. The default setting is **60**.

View SMBIOS Event Log

This item allows the user to view the event in the SMBIOS event log. Select this item and press <Enter> to view the status of an event in the log as shown below:

Date/Time/Error Code/Severity

View System Event Log

This item allows the user to view the event in the system event log. Select this item and press <Enter> to view the status of an event in the log as shown below:

Date/Time/Sensor/Type

7-4 IPMI

Use this feature to configure Intelligent Platform Management Interface (IPMI) settings.

IPMI Firmware Revision

This item indicates the IPMI firmware revision used in your system.

IPMI Status

This item indicates the status of the IPMI firmware installed in your system.

►System Event Log

Enabling/Disabling Options

SEL Components

Select Enabled for all system event logging at bootup. The options are **Enabled** and Disabled.

Erasing Settings

Erase SEL

Select Yes, On next reset to erase all system event logs upon next system reboot. Select Yes, On every reset to erase all system event logs upon each system reboot. Select No to keep all system event logs after each system reboot. The options are **No**, Yes, On next reset, and Yes, On every reset.

When SEL is Full

This feature allows the user to decide what the BIOS should do when the system event log is full. Select Erase Immediately to erase all events in the log when the system event log is full. The options are **Do Nothing** and Erase Immediately.

Customize EFI Logging Options

Log EFI Status Codes

Select Enabled to log EFI (Extensible Firmware Interface) Status Codes, Error Codes or Progress Codes. The options are **Enabled** and Disabled.

Note: After making changes on a setting, be sure to reboot the system for the changes to take effect.

►BMC Network Configuration

LAN Channel 1: This feature allows the user to configure the settings for LAN1 Port.

Update IPMI LAN Configuration

This feature allows the user to decide if the BIOS should configure the IPMI setting at next system boot. The options are **No** and Yes. If the option is set to Yes, BIOS will configure the following settings to IPMI at next system boot:

Configuration Address Source

This feature allows the user to select the source of the IP address for this computer. If Static is selected, you will need to know the IP address of this computer and enter it to the system manually in the field. If DHCP is selected, the BIOS will search for a DHCP (Dynamic Host Configuration Protocol) server in the network that is attached to and request the next available IP address for this computer. The options are **DHCP** and Static. The following items are assigned IP addresses automatically if DHCP is selected.

Station IP Address

This item displays the Station IP address for this computer. This should be in decimal and in dotted quad form (i.e., 192.168.10.253).

Subnet Mask

This item displays the sub-network that this computer belongs to. The value of each three-digit number separated by dots should not exceed 255.

Station MAC Address

This item displays the Station Mac address for this computer. Mac addresses are 6 two-digit hexadecimal numbers.

Gateway IP Address

This item displays the Gateway IP address for this computer. This should be in decimal and in dotted quad form (i.e., 192.168.10.253).

7-5 Boot

This submenu allows the user to configure the following boot settings for the system.

CSM Support

Select Enabled to support the EFI Compatibility Support Module (CSM), which provides compatibility support for traditional legacy BIOS for system boot. The options are **Enabled**, Disabled and Auto.

Boot Option Priorities

Boot Option #1~ Boot Option #4

This item allows the user to select the first boot drive. Select a LAN device to boot the system from the network connection. Select UEFI to boot the system from the UEFI: Built-in EFI Shell. The options are LAN Device, UEFI: Built-in EFI Shell, and Disabled.

USB Device BBS Priorities

Hard Disk Drives

Boot Option #1~ Boot Option #3

This item displays the first boot device.

Network Drives

Boot Option #1

This item displays the first boot device.

►Delete Boot Options

Delete Boot Option

This item allows the user to select a boot device to delete from the boot priority list. Select UEFI: Built-in EFI Shell to delete it from the boot priority list which will prevent system boot from the UEFI Shell. The options are Select One to Delete and **UEFI: Built-in EFI Shell**.

7-6 Security

This menu allows the user to configure the following security settings for the system.

Administrator Password

Use this feature to set the Administrator Password which is required to enter the BIOS setup utility. The length of the password should be from 3 characters to 20 characters long.

User Password

Use this feature to set a User Password which is required to log into the system and to enter the BIOS setup utility. The length of the password should be from 3 characters to 20 characters long.

7-7 Save & Exit

This submenu allows the user to configure the Save and Exit settings for the system.

Discard Changes and Exit

Select this option to quit the BIOS Setup without making any permanent changes to the system configuration, and reboot the computer. Select Discard Changes and Exit, and press <Enter>. When the dialog box appears, asking you if you want to exit the BIOS setup without saving, click **Yes** to quit BIOS without saving the changes, or click No to quit the BIOS and save changes.

Save Changes and Reset

When you have completed the system configuration changes, select this option to save the changes and reboot the computer so that the new system configuration settings can take effect. Select Save Changes and Exit, and press <Enter>. When the dialog box appears, asking you if you want to exit the BIOS setup without saving, click **Yes** to quit BIOS without saving the changes, or click No to quit the BIOS and save changes.

Save Options

Save Changes

Select this option and press <Enter> to save all changes you've done so far and return to the AMI BIOS utility Program. When the dialog box appears, asking you if you want to save configuration, click **Yes** to save the changes, or click No to return to the BIOS without making changes.

Discard Changes

Select this feature and press <Enter> to discard all the changes and return to the BIOS setup. When the dialog box appears, asking you if you want to load previous values, click **Yes** to load the values previous saved, or click No to keep the changes you've made so far.

Restore Optimized Defaults

Select this feature and press <Enter> to load the optimized default settings that help optimize system performance. When the dialog box appears, asking you if you want to load optimized defaults, click **Yes** to load the optimized default settings, or click No to abandon optimized defaults.

Save as User Defaults

Select this feature and press <Enter> to save the current settings as the user's defaults. When the dialog box appears, asking you if you want to save values as user's defaults, click **Yes** to save the current values as user's default settings, or click No to keep the defaults previously saved as the user's defaults.

Restore User Defaults

Select this feature and press <Enter> to load the user's defaults previously saved in the system. When the dialog box appears, asking you if you want to restore user's defaults, click **Yes** to restore the user's defaults previously saved in the system, or click No to abandon the user's defaults that were previously saved.

Boot Override

This feature allows the user to temporarily override the original boot order and boot the system to a selected device immediately:

- LAN Device
- UEFI: Built-in EFI Shell

Appendix A

BIOS Error Beep Codes

During the POST (Power-On Self-Test) routines, which are performed each time the system is powered on, errors may occur.

Non-fatal errors are those which, in most cases, allow the system to continue the boot-up process. The error messages normally appear on the screen.

Fatal errors are those which will not allow the system to continue the boot-up procedure. If a fatal error occurs, you should consult with your system manufacturer for possible repairs.

These fatal errors are usually communicated through a series of audible beeps. The numbers on the fatal error list (on the following page) correspond to the number of beeps for the corresponding error. All errors listed, with the exception of Beep Code 8, are fatal errors.

A-1 AMIBIOS Error Beep Codes

Beep Code	Error Message	Description
1 beep	Refresh	Circuits have been reset (Ready to power up)
5 short beeps and 1 long beep	Memory error	No memory detected in the system
5 long and 2 short beeps	Display memory read/write error	Video adapter missing or with faulty memory
1 Continuous beep	System OH	System Overheat

Notes

Appendix B

System Specifications

Processors

Dual Intel E5-2600 series (Socket R LGA 2011 type) processors

Note: You must install at least two processors for full functions to be supported.

Note: Please refer to our web site for a complete listing of supported processors.

Chipset

One Intel PCH C602 chipset

BIOS

16 Mb AMI BIOS® Flash EPROM

Memory Capacity

The X9DRW-iF has sixteen (16) single/dual/tri/quad channel 240-pin DIMM sockets that can support up to 512 GB of DDR3 1600/1333/1066/800 MHz speed registered ECC RDIMM/LRDIMM SDRAM in two-channel memory bus. Memory sizes of 512 MB, 1 GB, 2 GB, 4 GB, 8 GB, 16 GB or 32 GB size @ 1.35V/1.5V voltages are supported.

Note: See the memory section in Chapter 5 for details.

SATA Controller

Intel PCH C602 on-chip controller for six-port Serial ATA (RAID 0, 1, 5 and 10 for Windows or RAID 0, 1 and 10 for LINUX supported)

Drive Bays

The SC113 chassis has eight (8) hot-swap drive bays to house up to eight SATA drives

Peripheral Drive Bays

One (1) optional slim DVD-ROM drive (not included with SuperServer 1027R-WRF)

Expansion Slots

Left side: two full height 6.6" length PCI-E 3.0 x16 cards

Serverboard

X9DRW-iF (Proprietary form factor)

Dimensions: (LxW) 13.05 x 12.29 in. (331.47 x 312.17 mm)

Chassis

SC113TQ-R700WB (1U rackmount form factor)

Dimensions: (WxHxD) 17.2 x 1.7 x 23.5 in. (437 x 43 x 597 mm)

Weight

Gross (Bare Bone): 33 lbs. (15 kg.)

System Cooling

The SuperServer 1027R-WRF has five (5) 4-cm system cooling fans

System Input Requirements

AC Input Voltage: 100-240 VAC

Rated Input Current: 8.3A (100V) to 3.8A (240V)

Rated Input Frequency: 60-50 Hz

Platinum: 90+ (Platinum Level)

Power Supply

Rated Output Power: 700 Watt (Model# PWS-704P-1R)

Rated Output Voltages: +12V (12A), +5Vsb (5A)

Operating Environment

Operating Temperature: 0° to 35° C (32° to 95° F)

Non-operating Temperature: -10° to 60° C (14° to 140° F)

Operating Relative Humidity: 20% to 90% (non-condensing)

Non-operating Relative Humidity: 5 to 95% (non-condensing)

Regulatory Compliance

Electromagnetic Emissions: FCC Class A, EN 55022 Class A, EN 61000-3-2/-3-3, CISPR 22 Class A

Electromagnetic Immunity: EN 55024/CISPR 24, (EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5, EN 61000-4-6, EN 61000-4-8, EN 61000-4-11)

Safety: CSA/EN/IEC/UL 60950-1 Compliant, UL or CSA Listed (USA and Canada), CE Marking (Europe)

California Best Management Practices Regulations for Perchlorate Materials:
This Perchlorate warning applies only to products containing CR (Manganese Dioxide) Lithium coin cells. "Perchlorate Material-special handling may apply. See www.dtsc.ca.gov/hazardouswaste/perchlorate"

(continued from front)

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